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NOTIFICATION PLATFORM

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ABSTRACT

Systems, methods and computer readable media for notification platforms are described. Some implementations can include a method. A method can include receiving one or more notification messages and determining at least one recipient associated with each notification message. The method can also include generating a social affinity score for each notification message. The method can further include ranking the notification messages for each recipient based on the social affinity score of each notification message and delivering the notification messages to each recipient according to the rank for each notification message. The method can also include determining that a notification is a low-priority notification based on one or more of a user associated with the notification and notification settings. The method can further include displaying the low-priority notification in a section of a user interface for low-priority notifications when a notification has been determined to be a low-priority notification.

BACKGROUND

Some computer users may rely on a plurality of devices to communicate with others and to receive notifications on. These devices can include desktop and laptop computers, as well as other wireless devices such as smart phones, tablet devices, media players, and the like.

Some applications or systems may be able to deliver notifications to a single device, which is typically associated with an installation of an application on that device. However, the notifications may be general notifications delivered without priority. Also, delivery of the notifications may be limited to devices having certain applications and/or operating systems.

Further, existing notification systems may not be able to synchronize notifications across multiple devices and operating systems.

SUMMARY

Some implementations relate generally to notification delivery to computerized devices, and more particularly to delivery of notifications based on social affinity and/or device usage characteristics.

Some implementations can include a method. The method can include receiving one or more notification messages and determining at least one recipient associated with each notification message. The method can also include generating a social affinity score for each notification message.

The social affinity score can be based on a social affinity between a recipient of the notification message and at least one other user of a social network associated with the notification message. The social affinity score can also be based on one or more of a degree of separation between the recipient and the at least one other user, a duration of time the at least one other user has been a member of the social network, a number of interactions between the recipient and the at least one other user, a location history of the recipient or the at least one other user, a duration of check-in of the recipient or the at least one other user, a frequency of check-in of the recipient or the at least one other user and authorship of content corresponding to the notification message.

The method can further include ranking the notification messages for each recipient based on the social affinity score of each notification message and delivering the notification messages to each recipient according to the rank for each notification message.

The method can also include determining device usage characteristics associated with the at least one recipient and delivering the notification messages to the at least one recipient according to the rank for each notification message and the device usage characteristics. Determining device usage characteristics can include determining one or more devices associated with an account corresponding to each recipient and determining usage characteristics for the one or more devices. The device usage characteristics can include one or more of which devices a recipient primarily uses to read messages, which devices a recipient primarily uses to respond to messages, what time of day a recipient uses each device and a geo-location of the user.

Some implementations can include a method. The method can include receiving one or more notification messages and determining at least one recipient associated with each notification message. The method can also include generating a social affinity score for each notification message and ranking the notification messages for each recipient based on the social affinity score. The method can further include determining device usage characteristics associated with each recipient delivering the notification messages to each recipient according to the rank for each notification message and the device usage characteristics.

The social affinity score can be based on a social affinity between a recipient of the notification message and at least one other user of a social network associated with the notification message. The social affinity score can be based on one or more of a degree of separation between the recipient and the at least one other user, a duration of time the at least one other user has been a member of the social network, a number of interactions between the recipient and the at least one other user, a location history of the recipient or the at least one other user, a duration of check-in of the recipient or the at least one other user, a frequency of check-in

of the recipient or the at least one other user and authorship of content corresponding to the notification message.

Determining device usage characteristics can include determining one or more devices associated with an account corresponding to each recipient and determining usage characteristics for the one or more devices. The method can also include synchronizing a notification state of one or more notifications messages across the one or more devices corresponding to each recipient.

The device usage characteristics can include one or more of which devices a recipient primarily uses to read messages, which devices a recipient primarily uses to respond to messages, what time of day a recipient uses each device and a geo-location of the user.

The method can also include determining that a notification is a low-priority notification based on one or more of a user associated with the notification and notification settings. The method can further include displaying the low-priority notification in a section of a user interface for low-priority notifications when a notification has been determined to be a low-priority notification.

Some implementations can include a system comprising one or more computers configured to perform operations. The operations can include receiving one or more notification messages and determining at least one recipient associated with each notification message. The operations can also include generating a social affinity score for each notification message and ranking the notification messages for each recipient based on the social affinity score. The operations can further include determining device usage characteristics associated with each recipient and delivering the notification messages to each recipient according to the rank for each notification message and the device usage characteristics.

The social affinity score can be based on a social affinity between a recipient of the notification message and at least one other user of a social network associated with the notification message. The social affinity score can also be based on one or more of a degree of separation between the recipient and the at least one other user, a duration of time the at least one other user has been a member of the social network, a number of interactions between the recipient and the at least one other user, a location history of the recipient or the at least one other user, a duration of check-in of the recipient or the at least one other user, a frequency of check-in of the recipient or the at least one other user and authorship of content corresponding to the notification message.

Determining device usage characteristics can include determining one or more devices associated with an account corresponding to each recipient and determining usage characteristics for the one or more devices. The operations can also include synchronizing a notification state of one or more notifications messages across the one or more devices corresponding to each recipient. Device usage characteristics can include one or more of which devices a recipient primarily uses to read messages, which devices a recipient primarily uses to respond to messages, what time of day a recipient uses each device and a geo-location of the user.

Device usage characteristics can also include device usage context. Device usage context can include one or more of include geo-location of a user, an activity the user is engaged in, check-in of the user, status updates of the user and an event the user is attending.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows an example system for notification delivery in accordance with some implementations.

FIG. 2 is a flow chart for an example notification platform in accordance with some implementations.

FIG. 3 is a server diagram for notification delivery in accordance with some implementations.

FIG. 4 is a flow chart showing an example method for notification delivery based on social affinity in accordance with some implementations.

FIG. 5 is a flow chart of an example method for notification delivery based on device usage characteristics in accordance with some implementations.

FIG. 6 is a diagram of an example system for presenting notifications across multiple devices in accordance with some implementations.

FIG. 7 is a flow chart of an example method for presenting notifications across multiple devices in accordance with some implementations.

FIG. 8 is a flow chart of an example method for presenting notifications across multiple devices in accordance with some implementations.

FIGS. 9A-9C show example user interfaces for presenting notifications in accordance with some implementations.

FIG. 10 shows an example user interface for presenting notifications and receiving an indication to dismiss a notification in accordance with some implementations.

FIG. 11 shows an example user interface for presenting notifications and a user interface element for dismissing notifications in accordance with some implementations.

FIG. 12 shows an example user interface with an empty notification tray and call to action in accordance with some implementations.

FIG. 13 shows a diagram of an example low priority notification in accordance with some implementations.

FIG. 14 shows a diagram of an example notification user interface in accordance with some implementations.

FIG. 15 shows a diagram of an example user interface for setting notification preferences in accordance with some implementations.

FIG. 16 shows a diagram of an example user interface for viewing user information from a notification in accordance with some implementations.

FIG. 17 shows a diagram of an example user interface for viewing user information for multiple users from a notification in accordance with some implementations.

DETAILED DESCRIPTION

In situations in which the systems and methods discussed herein may collect or use personal information about users (e.g., user data, information about a user's social network, user's location, user's biometric information, user's activities and demographic information), users are provided with one or more opportunities to control whether information is collected, whether the personal information is stored, whether the personal information is used, and how the information is collected about the user, stored and used. That is, the systems and methods discussed herein collect, store and/or use user personal information only upon receiving explicit authorization from the relevant users to do so. For example, a user is provided with control over whether programs or features collect user information about that particular user or other users relevant to the program or feature. Each user for which personal information is to be collected is presented with one or more options to allow control over the information collection relevant to that user, to provide permission or authorization as to whether the information is collected and as to which portions of the information are to be collected. For example, users can be provided

with one or more such control options over a communication network. In addition, certain data may be treated in one or more ways before it is stored or used so that personally identifiable information is removed. As one example, a user's identity may be treated so that no personally identifiable information can be determined. As another example, a user's geographic location may be generalized to a larger region so that the user's particular location cannot be determined.

A method for delivery of notifications based on social affinity and/or device usage characteristics is described. A social affinity score can be generated for each message. The social affinity score can be based on a relationship between the sender and recipient of the message within a social graph. Also, device usage characteristics can be determined and used to deliver and synchronize notification messages.

In some implementations, the method can include receiving one or more notification messages using one or more processors and determining at least one recipient associated with each notification message.

The method can also include generating, using the one or more processors, a social affinity score for each message. The social affinity score can be based on the recipient's relationship with other people associated with the message, such as the sender. For example, the social affinity score can be based on the degree of separation between the message sender and the recipient. The social affinity score can also be based the recipient's history of social network activity. For example, the score can reflect whether the recipient reads or dismisses messages from the sender.

The method can further include ranking each recipient's notification messages based on social affinity score. The method can also include delivering the notification messages to each recipient based on the ranking. For example, messages having a rank indicating a higher degree

of social affinity may be delivered first. Also, messages having a rank above a certain threshold may be delivered before messages having a rank below the threshold.

The social affinity score can also be based on a user's duration on the social network, number of interactions between a recipient and a sender, location history, duration of check-in, frequency of check-in, pattern of social network usage, authorship (e.g., whether the notification related to content the recipient has authored or posted) and the like.

The method can also include delivering messages based on device usage characteristics of devices associated with the recipient.

FIG. 1 shows an example notification delivery platform environment 100. The environment 100 includes a notification delivery platform 102, a plurality of applications 104-108, a social network database 110, a user account 112. The user account 112 is associated with a plurality of user devices 114 -118.

In operation, the notification delivery platform 102 receives notification messages for delivery from one or more of the apps 104-108. Also, the notification delivery platform 102 can receive social graph information from the database 110 and user device usage characteristics from the devices 114-118 associated with the user account 112. The notification delivery platform can receive one or more notifications from the apps 104-108, via network 120, and can prioritize delivery of the notifications based on the social graph information and/or device usage characteristics.

For example, the notification delivery platform 102 can use information from the social graph 110 to determine a social affinity with a user associated with one or more of the notification messages. The notification messages coming from users having higher social

affinity may be delivered first or with a higher priority than notification messages coming from a user associated with a lower social affinity.

Also notification messages may be delivered based on one or more device usage characteristics. For example, if two users log into their accounts from the same device it can inferred that the two users have a high degree of affinity or social connection to each other such that they are able to log in using the same device (e.g., they may be married). This information can be used to prioritize the delivery of notification messages between the two users.

Delivery of notifications can include transmitting a notification from the notification platform to one or more devices. The delivery can occur as transmission of electronic data from the platform to one or more devices. Delivery of notifications based on social affinity and/or device usage characteristics is described in greater detail below in connection with FIGS. 4 and 5.

FIG. 2 shows an example method for notification delivery in accordance with some implementations. Processing begins at 202, where user account information is obtained. User account information can include a listing of devices associated with the account and information about the devices, such as capabilities and installed applications. Processing continues to 204.

At 204, an application registration request is received. An installed application or an application server may request to be registered with the notification platform in order to delivery notifications to one or more of the devices associated with the user and/or account. Processing continues to 206.

At 206, the application is registered according to the application registration request. The notification platform may register the application and the notification permissions that have been given by the user. Processing continues to 208.

At 208, a notification is received from the registered application. An external system sends a notification request to the notification platform. The notification can include a unique identifier of the user and/or device, the notification information and other information associated with the notification (e.g., response options, URL of web service associated with application and the like). Processing continues to 210.

At 210, the notification from the registered application is delivered based on account information and/or social affinity. The account information can include devices associated with the user account, notice states associated with those devices, and the like. The notification can also be delivered based on device usage characteristics and device usage context, or a combination of the above.

It will be appreciated that 202-210 can be repeated in whole or in part in order to accomplish a contemplated notification delivery task.

FIG. 3 is a diagram of an example computing device 300 that can be used as a notification platform in accordance with some implementations. The computing device 300 includes a processor 302, operating system 304, memory 306 and I/O interface 308. The memory 306 can include a notification platform application 310 and a notification database 312.

In operation, the processor 302 may execute the notification platform application 310 stored in the memory 306. The notification platform application 310 can include software instructions that, when executed by the processor, cause the processor to perform operations for a notification platform in accordance with the present disclosure (e.g., the notification platform 310 can perform one or more of steps 202-210 described above and/or one or more of 402-410 and/or 502-512 described below and, in conjunction, can access the notification database 312).

The notification platform 310 can also operate in conjunction with the operating system 304, and a user account system and a social graph (as shown in FIG. 1).

The notification platform computing device (e.g., 102 and/or 300) can include, but is not limited to, a single processor system, a multi-processor system (co-located or distributed), a cloud computing system, or a combination of the above.

The client (or user) device(s) can include, but are not limited to, a desktop computer, a laptop computer, a portable computer, a tablet computing device, a smartphone, a feature phone, a personal digital assistant, a media player, televisions, an electronic book reader, an entertainment system of a vehicle or the like. Also, user devices can include wearable computing devices (e.g., glasses, watches and the like), furniture mounted computing devices and/or building mounted computing devices.

The user devices can be connected to a notification platform via a network (e.g., 120). The network connecting user devices to the notification platform can be a wired or wireless network, and can include, but is not limited to, a WiFi network, a local area network, a wide area network, the Internet, or a combination of the above.

The data storage, memory and/or computer readable medium can be a nontransitory medium such as a magnetic storage device (hard disk drive or the like), optical storage device (CD, DVD or the like), or electronic storage device (RAM, ROM, flash, or the like). The software instructions can also be contained in, and provided as, an electronic signal, for example in the form of software as a service (SaaS) delivered from a server (e.g., a distributed system and/or a cloud computing system).

FIG. 4 shows a flow chart of an example method for notification delivery based on social affinity. Processing begins at 402, where one or more notification messages are received. Processing continues to 404.

At 404, at least one recipient associated with each message is determined. Processing continues to 406. At 406, a social affinity score is generated for each message. The social affinity score can be based on the recipient's relationship with other people associated with the message, such as the sender. For example, a social affinity score can be based on the degree of separation between the message sender and the recipient. The social affinity score can also be based on the recipient's history of social network activity. For example, the score can reflect whether the recipient reads or dismisses messages from the sender.

The social affinity score can also be based on a user's duration on the social network, the number of interactions between a recipient and a sender, a location history of the sender and/or recipient, a duration of check-in of the sender and/or recipient, a frequency of check-in of the sender and/or recipient, a pattern of social network usage, authorship (e.g., whether the notification relates to content the recipient has authored or posted) and/or the like.

The social affinity score can be a combination of value/weight products, where each value selected for inclusion in the social affinity score can be scaled by a weight for that value. Accordingly, values can be emphasized or de-emphasized in the social affinity score by adjusting the weight factors for each corresponding value/weight pair. Processing continues to 408.

At 408 notification messages are ranked based on the social affinity score computer at 406 for each message. For example, the messages can be ranked in order of highest to lowest affinity score. Processing continues to 410.

At 410, the notification messages are delivered based on the ranking. It will be appreciated that 402-410 can be repeated in whole or in part in order to accomplish a notification delivery task based on social affinity.

FIG. 5 is a flow chart of an example method for notification delivery based on device usage. Processing begins at 502, where one or more notification messages are received. Processing continues to 504.

At 504, a recipient associated with each message is determined. Processing continues to 506.

At 506 devices associated with each recipient are determined. The devices can be determined based on an account associated with each recipient. Processing continues to 508.

At 508, context and usage characteristics of the devices associated with each user (e.g., recipient) are determined. Device usage characteristics can include (but aren't limited to) one or more of which devices a recipient primarily uses to read messages, which devices a recipient primarily uses to respond to messages, what times of a day a recipient uses each device, geo-location of the user and/or the like. For example, the recipient may primarily use a desktop computer during the work day and primarily use a smart phone in the evenings. The system can then deliver notifications based on these usage characteristics. For example, the system can deliver notifications to the desktop computer at all times and to the smart phone only in the evenings.

In addition to, or as an alternative to device usage characteristics, the system can also determine device usage context and deliver notifications based on device usage characteristics and/or context. For example, context can include geo-location of the user, activity of the user, check-ins of the user, status updates of the user, events the user is attending and the like. For

example, the system can determine that the context of a user is that the user is watching a movie. The system can deliver a notification of a friend's review of that movie. Processing continues to 510.

At 510, notification messages are delivered based on usage characteristics. Processing continues to 512.

At 512, notification state across the various devices is synchronized. For example, when a user reads a notification on one device associated with the user's account, the notification can be cleared, removed or indicated as having been read on the other devices associated with that user's account. In another example, if a notification concerns a message such as an email or text message, the notification can be synchronized (e.g., cleared, removed) when the user reads or deletes the message associated with the notification

It will be appreciated that 502-512 can be repeated in whole or in part in order to accomplish contemplated notification delivery task based on device usage characteristics.

FIG. 6 shows a system for presentation of notifications across multiple devices. The notification delivery platform 102 can receive one or more notification messages and determine a user and user account associated with each message. The platform 102 can determine one or more devices (e.g., 114 – 118) associated with a user account.

Once the devices associated with a user account (e.g., 114 – 118) are determined, the platform can obtain device attributes for each device. The attributes can be obtained from the user account or from the devices. The notification messages can be tailored (in format and/or content) for each device based on that device's attributes.

The notification platform 102 can send notifications to a corresponding notification component (602 – 606) on each respective device. The notification component (602 – 606) can

cause the notification to be displayed on one or more output components (608 – 612, respectively).

The output components 608 – 612 can include display screens, head mounted displays, furniture or wall-mounted displays, vehicle-mounted displays, projection displays, audio output devices, tactile output devices, a printer or the like.

The tailoring of notification messages can help provide a seamless experience across device platforms and can help optimize notifications for device platform strengths. Different device platforms may receive different notifications, where the notifications have been tailored to the device platform capabilities, such as display size. For example, a user may have registered an airline application, which is transmitting a notification about a flight delay and gate change. For an email platform, the notification platform may deliver the entire notification (e.g., "Flight 123 has been delayed and is now departing from Gate 23 in Terminal 2"). However, for wearable computing glasses, the notification platform may deliver a notification having reduced information density (e.g., the notification may simply state "Delayed. Terminal 2").

The optimization of notifications to different devices can also include tailoring based on device input capabilities. A notification can include one or more actionable user interface elements (e.g., screen buttons, audio prompts or the like). For example, a response to a notification received at a desktop or laptop computing platform can be based on keyboard input, a response from a touch screen device can be based on gesture input and a response from a wearable device (e.g., glasses and/or watches) may be based on voice input.

Notification messages can also be formatted based on priority. For example, the message font, font size, color, volume (for audio messages) can be formatted according to a message priority level (e.g., low, medium, high).

The optimization of the notifications can be performed at the notification platform level and/or at the device platform level. Each device can include the presentation optimization capabilities within the notification component (e.g., 602 – 606). The notification component (606) can have information about the device output components (608 – 612, respectively) and device input capabilities. The notification platform can deliver notification message to multiple devices (e.g., heterogeneous or homogenous devices) according to the methods set forth in FIGS. 7 and 8, which are described below.

FIG. 7 is a flow chart of an example method for notification delivery across multiple devices. Processing begins at 702, where one or more notification messages are received by a notification platform (e.g., 102). Processing continues to 704.

At 704, the system can determine at least one recipient associated with each message. Processing continues to 706.

At 706, the system can determine an account associated with each recipient. Based on the account information, the system can determine one or more devices associated with each account. Attributes for each device can be obtained from the account and/or from the devices. The attributes can include, but are not limited to, screen size, screen orientation, screen resolution, screen density, device type and device operating system. Processing continues to 708.

At 708, notification messages are tailored to each device based on the corresponding device attributes. The tailoring can include message format and/or content. Processing continues to 710.

At 710, the tailored notification messages are delivered to each device. The tailoring can be performed at the notification platform and/or at each device. If the tailoring was performed

on each device, then at 710 the notification can be caused to be displayed. It will be appreciated that 702 – 710 can be repeated in whole or in part in order to accomplish a contemplated notification delivery task.

FIG. 8 is a flow chart of an example method for handling tailored notification messages on a device. Processing begins at 802, where one or more tailored notification messages are received (or generated if the tailoring is being performed on the device). Processing continues to 804.

At 804, the tailored notification message(s) are presented on an output component of the device (e.g., screen, audio output component, tactile output component or the like). Processing continues to 806.

At 806, the device optionally receives a response to one or more actionable user interface elements associated with a notification message. Processing continues to 808.

At 808, the response is optionally processed. For example, the system may need to process voice or gesture data to obtain a text value. Processing continues to 810.

At 810, the response is optionally sent to the notification platform (or directly to another application or system). It will be appreciated that 802 – 810 can be repeated in whole or in part in order to accomplish a contemplated notification delivery task.

FIGS. 9A-9C show example user interfaces for presenting notifications in accordance with some implementations. As shown in FIG. 9A, a notification user interface 900 includes a plurality of notifications (902 – 906), a previously read notifications element 908 and a notification icon 910. The notification icon 910 can indicate the presence and/or state of notifications. For example, the notification icon 910 can be a three-state bell, where a clear bell indicates that the user has no unread notifications (910 in FIG. 9A), a filled bell shows unread

notifications (e.g., 912 in FIG. 9B), and a filled bell with a counter indicates unread notifications and the counter indicates the number of new unread notifications (e.g., 914 in FIG. 9C).

The previously read element 908 (or previously read bottom toolbar) toggles the user interface into a previously read view showing previously read messages. When the previously read element 908 is first tapped on a touch-screen interface (or selected on a pointer-based interface), the list of previously read notifications is displayed. The list can include a predetermined number of previously read notifications or a scrolling list that can be updated to retrieve any number of previously read messages in a scrolling list interface. When the previously read element 908 is tapped again on a touch-screen interface (or selected on a pointer-based interface), the list of previously read notifications is hidden (or minimized) and the display of current notifications is made visible.

A user can view one of a plurality of views of a notification. For example, by tapping or selecting a notification (e.g., 902 – 906) an expanded view can be displayed that shows just the new activity on the post, such as just the new comments. Also, a user can select to view a "full post" view of the notification where, for example, the entire post and all its activity history, such as all comments are displayed.

FIG. 10 shows an example user interface 1000 for presenting notifications and receiving an indication to dismiss a notification. For example, a notification 1002 can be dismissed by swiping across the notification. As shown by the dotted line arrows, the notification 1002 can be dismissed by a left to right swiping motion on a touch screen interface. For non-touch screen interface, a selectable element can be used to dismiss the notification.

FIG. 10 also shows that an unread notification 1004 can have a different visual appearance from a read notification 1006. For example, an unread notification 1004 can have a

bolder appearance and/or a different border pattern or color around the notification. A read notification can have a more muted appearance (e.g., be "grayed out" or "ghosted") and can have a different border color or pattern than a read notification.

FIG. 11 shows an example user interface 1100 for presenting notifications and a user interface element for dismissing notifications. The user interface 1100 can include a "dismiss all" element 1102 that, when tapped (or selected), causes all read and/or unread notifications to be dismissed.

FIG. 12 shows an example user interface 1200 with an empty notification tray and call to action. An empty notification tray can include a message indicating that there are no unread notifications. Also, when displaying an empty notification tray, a call to action element 1202 can be displayed that, when tapped (or selected), causes the user to be taken to another site or service such as a social network or the like. The call to action element 1202 can include dynamic information retrieved from the other service (e.g., social network) that can entice a user to remain engaged with the other service. For example, the call to action element 1202 can include information about recent social network activity such as "View 10 new posts from your groups" or the like.

FIG. 13 shows a diagram of an example low priority notification in accordance with some implementations. In particular, a user 1302 can have one or more groups of connected users 1304. The user 1302 can also have one or more extended groups 1306. The extended groups are groups that can include one or more users that are also members of the groups of connected users 1304.

In operation, a notification 1308 can be received from a user that is outside of the extended groups 1306 and the groups of connected users 1304. Such a notification can be

categorized as a low-priority notification. The system can deliver low-priority notifications to the device for display in a section of notifications configured for low-priority notifications. Also, the low-priority notifications may not alert the user upon delivery (e.g., by ringing, buzzing, or visually alerting on a device) and may not be shown in a notification tray (e.g., a section of the device user interface configured to display notifications or icons indicating availability of notifications). Low-priority notifications may be loaded on demand by the device, which can reduce battery power and/or bandwidth usage associated with low priority notifications.

FIG. 14 shows a diagram of an example notification user interface in accordance with some implementations. In particular, a notification tray 1400 can include a new and unread notification section 1402, an unread notification section 1404, a low-priority notification section 1406 and a previously read notification section 1408.

In operation, new, unread incoming notifications can be sent to the new and unread section 1402. This section may be collapsed or may be expanded by default to enable a user to more readily view these notifications. Once a notification has been seen by a user, but not read, it can be moved to the unread notifications section 1404.

Once a notification has been read, that notification can be moved to the previously read notifications section 1408. The previously read notifications 1408 can be sorted and displayed by time-delivered to the previously read section. Previously read low-priority notifications can be accessed in a separate section of the previously read notifications section 1408.

Low-priority notifications, as described above, are held in the low priority notification section 1406, which can be collapsed by default and opened when requested by a user. Once a low-priority notification has been read, it can be moved to the previously read notification

section 1408. Unread low-priority notifications can be ranked by social affinity and/or other factor(s).

The new and unread notifications 1402 and the unread notifications 1404 may both be shown as expanded sections in the user interface. The new and unread notifications 1402 may be made more visually prominent (e.g., by having bolder colors and or text, or the like) than the unread notifications 1404, which may be deemphasized by slight "graying out" of text and/or images, or by having more muted colors and/or text as compared to the new and unread notifications 1402.

FIG. 15 shows a diagram of an example user interface for setting notification preferences in accordance with some implementations. In particular, a notification setting interface 1500 can be configured to permit a user to select "who can notify me". In other words, the user can select which users or groups that notifications are permitted to be received from. The notifications settings can also be used to determine which notifications are considered "normal" priority and which are considered low-priority.

In operation, a user can select to receive notifications from one or more of extended groups 1502, the public 1504, other users in the user's groups 1506, and only the user 1508. The user can also select the "Pick People and Groups" selection 1510, which is configured to permit the user to select specific users and/or groups from which to receive notifications. The user interface also includes a cancel element 1512 to close the interface without making changes. Any changes to the notification settings can be automatically saved when the user exits the interface via any method other than the cancel element 1512, or a user interface element for saving the setting changes (not shown) can be provided.

In addition to, or as an alternative to, the method described above for determining a low-priority notification, the device and/or notification platform can also use the notification setting to determine low-priority notifications. For example, the notification platform and/or device can determine that any notification not from one of the users or groups selected in the settings user interface 1500 is a low-priority notification.

FIG. 16 shows a diagram of an example user interface 1600 for viewing user information from a notification. In operation, when an icon or image of a user associated with a notification 1602 is tapped (or selected), a profile page 1604 associated with that user can be displayed.

FIG. 17 shows a diagram of an example user interface 1700 for viewing user information for multiple users from a notification. In operation, when an icon or image of multiple users associated with a notification 1702 is tapped (or selected), a list 1704 showing the users and, optionally, an action taken by each user associated with the notification can be displayed. Also, the user list interface 1704 can include a button, link or other element 1706 to view the post that the users in the list took an action on (e.g., recommended, commented on, reposted or the like).

It will be appreciated that a user interface in accordance with the disclosed subject matter can include one or more of the features described above (e.g., the features described in connection with FIGS. 9 – 17). Also, it will be appreciated that the example user interfaces shown in FIGS. 9 – 17 can be implemented on mobile devices (e.g., wireless devices, tablets or the like) and on other devices such as desktop and laptop computers.

Moreover, some implementations of the disclosed method, system, and computer readable media can be implemented in software (e.g., as a computer program product and/or nontransitory computer readable media having stored instructions for notification platforms as

described herein). The stored software instructions can be executed on a programmed general purpose computer, a special purpose computer, a microprocessor, or the like.

In situations in which the systems and methods discussed herein may collect or use personal information about users (e.g., user data, information about a user's social network, a user's current and/or past geographical locations, user's activities, user demographic information (age, gender, profession, etc.), user's biometric information), users are provided with one or more opportunities to control whether the personal information is collected, whether the personal information is stored, whether the personal information is used, and how the information is collected about the user, stored and used. That is, the systems and methods discussed herein collect, store and/or use user personal information only upon receiving explicit authorization from the relevant users to do so. In addition, certain data may be treated in one or more ways before it is stored or used so that personally identifiable information is removed. As one example, a user's identity may be treated so that no personally identifiable information can be determined. As another example, a user's geographic location may be generalized to a larger region so that the user's particular location cannot be determined.

It is, therefore, apparent that there is provided, in accordance with the various example implementations disclosed herein, systems, methods and computer readable media for notification platforms.

NOTIFICATION PLATFORM

ABSTRACT

Systems, methods and computer readable media for notification platforms are described. Some implementations can include a method. A method can include receiving one or more notification messages and determining at least one recipient associated with each notification message. The method can also include generating a social affinity score for each notification message. The method can further include ranking the notification messages for each recipient based on the social affinity score of each notification message and delivering the notification messages to each recipient according to the rank for each notification message. The method can also include determining that a notification is a low-priority notification based on one or more of a user associated with the notification and notification settings. The method can further include displaying the low-priority notification in a section of a user interface for low-priority notifications when a notification has been determined to be a low-priority notification.

BACKGROUND

Some computer users may rely on a plurality of devices to communicate with others and to receive notifications on. These devices can include desktop and laptop computers, as well as other wireless devices such as smart phones, tablet devices, media players, and the like.

Some applications or systems may be able to deliver notifications to a single device, which is typically associated with an installation of an application on that device. However, the notifications may be general notifications delivered without priority. Also, delivery of the notifications may be limited to devices having certain applications and/or operating systems.

Further, existing notification systems may not be able to synchronize notifications across multiple devices and operating systems.

SUMMARY

Some implementations relate generally to notification delivery to computerized devices, and more particularly to delivery of notifications based on social affinity and/or device usage characteristics.

Some implementations can include a method. The method can include receiving one or more notification messages and determining at least one recipient associated with each notification message. The method can also include generating a social affinity score for each notification message.

The social affinity score can be based on a social affinity between a recipient of the notification message and at least one other user of a social network associated with the notification message. The social affinity score can also be based on one or more of a degree of separation between the recipient and the at least one other user, a duration of time the at least one other user has been a member of the social network, a number of interactions between the recipient and the at least one other user, a location history of the recipient or the at least one other user, a duration of check-in of the recipient or the at least one other user, a frequency of check-in of the recipient or the at least one other user and authorship of content corresponding to the notification message.

The method can further include ranking the notification messages for each recipient based on the social affinity score of each notification message and delivering the notification messages to each recipient according to the rank for each notification message.

The method can also include determining device usage characteristics associated with the at least one recipient and delivering the notification messages to the at least one recipient according to the rank for each notification message and the device usage characteristics. Determining device usage characteristics can include determining one or more devices associated with an account corresponding to each recipient and determining usage characteristics for the one or more devices. The device usage characteristics can include one or more of which devices a recipient primarily uses to read messages, which devices a recipient primarily uses to respond to messages, what time of day a recipient uses each device and a geo-location of the user.

Some implementations can include a method. The method can include receiving one or more notification messages and determining at least one recipient associated with each notification message. The method can also include generating a social affinity score for each notification message and ranking the notification messages for each recipient based on the social affinity score. The method can further include determining device usage characteristics associated with each recipient delivering the notification messages to each recipient according to the rank for each notification message and the device usage characteristics.

The social affinity score can be based on a social affinity between a recipient of the notification message and at least one other user of a social network associated with the notification message. The social affinity score can be based on one or more of a degree of separation between the recipient and the at least one other user, a duration of time the at least one other user has been a member of the social network, a number of interactions between the recipient and the at least one other user, a location history of the recipient or the at least one other user, a duration of check-in of the recipient or the at least one other user, a frequency of check-in

of the recipient or the at least one other user and authorship of content corresponding to the notification message.

Determining device usage characteristics can include determining one or more devices associated with an account corresponding to each recipient and determining usage characteristics for the one or more devices. The method can also include synchronizing a notification state of one or more notifications messages across the one or more devices corresponding to each recipient.

The device usage characteristics can include one or more of which devices a recipient primarily uses to read messages, which devices a recipient primarily uses to respond to messages, what time of day a recipient uses each device and a geo-location of the user.

The method can also include determining that a notification is a low-priority notification based on one or more of a user associated with the notification and notification settings. The method can further include displaying the low-priority notification in a section of a user interface for low-priority notifications when a notification has been determined to be a low-priority notification.

Some implementations can include a system comprising one or more computers configured to perform operations. The operations can include receiving one or more notification messages and determining at least one recipient associated with each notification message. The operations can also include generating a social affinity score for each notification message and ranking the notification messages for each recipient based on the social affinity score. The operations can further include determining device usage characteristics associated with each recipient and delivering the notification messages to each recipient according to the rank for each notification message and the device usage characteristics.

The social affinity score can be based on a social affinity between a recipient of the notification message and at least one other user of a social network associated with the notification message. The social affinity score can also be based on one or more of a degree of separation between the recipient and the at least one other user, a duration of time the at least one other user has been a member of the social network, a number of interactions between the recipient and the at least one other user, a location history of the recipient or the at least one other user, a duration of check-in of the recipient or the at least one other user, a frequency of check-in of the recipient or the at least one other user and authorship of content corresponding to the notification message.

Determining device usage characteristics can include determining one or more devices associated with an account corresponding to each recipient and determining usage characteristics for the one or more devices. The operations can also include synchronizing a notification state of one or more notifications messages across the one or more devices corresponding to each recipient. Device usage characteristics can include one or more of which devices a recipient primarily uses to read messages, which devices a recipient primarily uses to respond to messages, what time of day a recipient uses each device and a geo-location of the user.

Device usage characteristics can also include device usage context. Device usage context can include one or more of include geo-location of a user, an activity the user is engaged in, check-in of the user, status updates of the user and an event the user is attending.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows an example system for notification delivery in accordance with some implementations.

FIG. 2 is a flow chart for an example notification platform in accordance with some implementations.

FIG. 3 is a server diagram for notification delivery in accordance with some implementations.

FIG. 4 is a flow chart showing an example method for notification delivery based on social affinity in accordance with some implementations.

FIG. 5 is a flow chart of an example method for notification delivery based on device usage characteristics in accordance with some implementations.

FIG. 6 is a diagram of an example system for presenting notifications across multiple devices in accordance with some implementations.

FIG. 7 is a flow chart of an example method for presenting notifications across multiple devices in accordance with some implementations.

FIG. 8 is a flow chart of an example method for presenting notifications across multiple devices in accordance with some implementations.

FIGS. 9A-9C show example user interfaces for presenting notifications in accordance with some implementations.

FIG. 10 shows an example user interface for presenting notifications and receiving an indication to dismiss a notification in accordance with some implementations.

FIG. 11 shows an example user interface for presenting notifications and a user interface element for dismissing notifications in accordance with some implementations.

FIG. 12 shows an example user interface with an empty notification tray and call to action in accordance with some implementations.

FIG. 13 shows a diagram of an example low priority notification in accordance with some implementations.

FIG. 14 shows a diagram of an example notification user interface in accordance with some implementations.

FIG. 15 shows a diagram of an example user interface for setting notification preferences in accordance with some implementations.

FIG. 16 shows a diagram of an example user interface for viewing user information from a notification in accordance with some implementations.

FIG. 17 shows a diagram of an example user interface for viewing user information for multiple users from a notification in accordance with some implementations.

DETAILED DESCRIPTION

A method for delivery of notifications based on social affinity and/or device usage characteristics is described. A social affinity score can be generated for each message. The social affinity score can be based on a relationship between the sender and recipient of the message within a social graph. Also, device usage characteristics can be determined and used to deliver and synchronize notification messages.

In some implementations, the method can include receiving one or more notification messages using one or more processors and determining at least one recipient associated with each notification message.

The method can also include generating, using the one or more processors, a social affinity score for each message. The social affinity score can be based on the recipient's relationship with other people associated with the message, such as the sender. For example, the social affinity score can be based on the degree of separation between the message sender and the recipient. The social affinity score can also be based the recipient's history of social network

activity. For example, the score can reflect whether the recipient reads or dismisses messages from the sender.

The method can further include ranking each recipient's notification messages based on social affinity score. The method can also include delivering the notification messages to each recipient based on the ranking. For example, messages having a rank indicating a higher degree of social affinity may be delivered first. Also, messages having a rank above a certain threshold may be delivered before messages having a rank below the threshold.

The social affinity score can also be based on a user's duration on the social network, number of interactions between a recipient and a sender, location history, duration of check-in, frequency of check-in, pattern of social network usage, authorship (e.g., whether the notification related to content the recipient has authored or posted) and the like.

The method can also include delivering messages based on device usage characteristics of devices associated with the recipient.

FIG. 1 shows an example notification delivery platform environment 100. The environment 100 includes a notification delivery platform 102, a plurality of applications 104-108, a social network database 110, a user account 112. The user account 112 is associated with a plurality of user devices 114 -118.

In operation, the notification delivery platform 102 receives notification messages for delivery from one or more of the apps 104-108. Also, the notification delivery platform 102 can receive social graph information from the database 110 and user device usage characteristics from the devices 114-118 associated with the user account 112. The notification delivery platform can receive one or more notifications from the apps 104-108, via network 120, and can

prioritize delivery of the notifications based on the social graph information and/or device usage characteristics.

For example, the notification delivery platform 102 can use information from the social graph 110 to determine a social affinity with a user associated with one or more of the notification messages. The notification messages coming from users having higher social affinity may be delivered first or with a higher priority than notification messages coming from a user associated with a lower social affinity.

Also notification messages may be delivered based on one or more device usage characteristics. For example, if two users log into their accounts from the same device it can inferred that the two users have a high degree of affinity or social connection to each other such that they are able to log in using the same device (e.g., they may be married). This information can be used to prioritize the delivery of notification messages between the two users.

Delivery of notifications can include transmitting a notification from the notification platform to one or more devices. The delivery can occur as transmission of electronic data from the platform to one or more devices. Delivery of notifications based on social affinity and/or device usage characteristics is described in greater detail below in connection with FIGS. 4 and 5.

FIG. 2 shows an example method for notification delivery in accordance with some implementations. Processing begins at 202, where user account information is obtained. User account information can include a listing of devices associated with the account and information about the devices, such as capabilities and installed applications. Processing continues to 204.

At 204, an application registration request is received. An installed application or an application server may request to be registered with the notification platform in order to delivery

notifications to one or more of the devices associated with the user and/or account. Processing continues to 206.

At 206, the application is registered according to the application registration request. The notification platform may register the application and the notification permissions that have been given by the user. Processing continues to 208.

At 208, a notification is received from the registered application. An external system sends a notification request to the notification platform. The notification can include a unique identifier of the user and/or device, the notification information and other information associated with the notification (e.g., response options, URL of web service associated with application and the like). Processing continues to 210.

At 210, the notification from the registered application is delivered based on account information and/or social affinity. The account information can include devices associated with the user account, notice states associated with those devices, and the like. The notification can also be delivered based on device usage characteristics and device usage context, or a combination of the above.

It will be appreciated that 202-210 can be repeated in whole or in part in order to accomplish a contemplated notification delivery task.

FIG. 3 is a diagram of an example computing device 300 that can be used as a notification platform in accordance with some implementations. The computing device 300 includes a processor 302, operating system 304, memory 306 and I/O interface 308. The memory 306 can include a notification platform application 310 and a notification database 312.

In operation, the processor 302 may execute the notification platform application 310 stored in the memory 306. The notification platform application 310 can include software

instructions that, when executed by the processor, cause the processor to perform operations for a notification platform in accordance with the present disclosure (e.g., the notification platform 310 can perform one or more of steps 202-210 described above and/or one or more of 402-410 and/or 502-512 described below and, in conjunction, can access the notification database 312). The notification platform 310 can also operate in conjunction with the operating system 304, and a user account system and a social graph (as shown in FIG. 1).

The notification platform computing device (e.g., 102 and/or 300) can include, but is not limited to, a single processor system, a multi-processor system (co-located or distributed), a cloud computing system, or a combination of the above.

The client (or user) device(s) can include, but are not limited to, a desktop computer, a laptop computer, a portable computer, a tablet computing device, a smartphone, a feature phone, a personal digital assistant, a media player, televisions, an electronic book reader, an entertainment system of a vehicle or the like. Also, user devices can include wearable computing devices (e.g., glasses, watches and the like), furniture mounted computing devices and/or building mounted computing devices.

The user devices can be connected to a notification platform via a network (e.g., 120). The network connecting user devices to the notification platform can be a wired or wireless network, and can include, but is not limited to, a WiFi network, a local area network, a wide area network, the Internet, or a combination of the above.

The data storage, memory and/or computer readable medium can be a nontransitory medium such as a magnetic storage device (hard disk drive or the like), optical storage device (CD, DVD or the like), or electronic storage device (RAM, ROM, flash, or the like). The software instructions can also be contained in, and provided as, an electronic signal, for example

in the form of software as a service (SaaS) delivered from a server (e.g., a distributed system and/or a cloud computing system).

FIG. 4 shows a flow chart of an example method for notification delivery based on social affinity. Processing begins at 402, where one or more notification messages are received. Processing continues to 404.

At 404, at least one recipient associated with each message is determined. Processing continues to 406. At 406, a social affinity score is generated for each message. The social affinity score can be based on the recipient's relationship with other people associated with the message, such as the sender. For example, a social affinity score can be based on the degree of separation between the message sender and the recipient. The social affinity score can also be based on the recipient's history of social network activity. For example, the score can reflect whether the recipient reads or dismisses messages from the sender.

The social affinity score can also be based on a user's duration on the social network, the number of interactions between a recipient and a sender, a location history of the sender and/or recipient, a duration of check-in of the sender and/or recipient, a frequency of check-in of the sender and/or recipient, a pattern of social network usage, authorship (e.g., whether the notification relates to content the recipient has authored or posted) and/or the like.

The social affinity score can be a combination of value/weight products, where each value selected for inclusion in the social affinity score can be scaled by a weight for that value. Accordingly, values can be emphasized or de-emphasized in the social affinity score by adjusting the weight factors for each corresponding value/weight pair. Processing continues to 408.

At 408 notification messages are ranked based on the social affinity score computer at 406 for each message. For example, the messages can be ranked in order of highest to lowest affinity score. Processing continues to 410.

At 410, the notification messages are delivered based on the ranking. It will be appreciated that 402-410 can be repeated in whole or in part in order to accomplish a notification delivery task based on social affinity.

FIG. 5 is a flow chart of an example method for notification delivery based on device usage. Processing begins at 502, where one or more notification messages are received. Processing continues to 504.

At 504, a recipient associated with each message is determined. Processing continues to 506.

At 506 devices associated with each recipient are determined. The devices can be determined based on an account associated with each recipient. Processing continues to 508.

At 508, context and usage characteristics of the devices associated with each user (e.g., recipient) are determined. Device usage characteristics can include (but aren't limited to) one or more of which devices a recipient primarily uses to read messages, which devices a recipient primarily uses to respond to messages, what times of a day a recipient uses each device, geo-location of the user and/or the like. For example, the recipient may primarily use a desktop computer during the work day and primarily use a smart phone in the evenings. The system can then deliver notifications based on these usage characteristics. For example, the system can deliver notifications to the desktop computer at all times and to the smart phone only in the evenings.

In addition to, or as an alternative to device usage characteristics, the system can also determine device usage context and deliver notifications based on device usage characteristics and/or context. For example, context can include geo-location of the user, activity of the user, check-ins of the user, status updates of the user, events the user is attending and the like. For example, the system can determine that the context of a user is that the user is watching a movie. The system can deliver a notification of a friend's review of that movie. Processing continues to 510.

At 510, notification messages are delivered based on usage characteristics. Processing continues to 512.

At 512, notification state across the various devices is synchronized. For example, when a user reads a notification on one device associated with the user's account, the notification can be cleared, removed or indicated as having been read on the other devices associated with that user's account. In another example, if a notification concerns a message such as an email or text message, the notification can be synchronized (e.g., cleared, removed) when the user reads or deletes the message associated with the notification

It will be appreciated that 502-512 can be repeated in whole or in part in order to accomplish contemplated notification delivery task based on device usage characteristics.

FIG. 6 shows a system for presentation of notifications across multiple devices. The notification delivery platform 102 can receive one or more notification messages and determine a user and user account associated with each message. The platform 102 can determine one or more devices (e.g., 114 – 118) associated with a user account.

Once the devices associated with a user account (e.g., 114 – 118) are determined, the platform can obtain device attributes for each device. The attributes can be obtained from the

user account or from the devices. The notification messages can be tailored (in format and/or content) for each device based on that device's attributes.

The notification platform 102 can send notifications to a corresponding notification component (602 – 606) on each respective device. The notification component (602 – 606) can cause the notification to be displayed on one or more output components (608 – 612, respectively).

The output components 608 – 612 can include display screens, head mounted displays, furniture or wall-mounted displays, vehicle-mounted displays, projection displays, audio output devices, tactile output devices, a printer or the like.

The tailoring of notification messages can help provide a seamless experience across device platforms and can help optimize notifications for device platform strengths. Different device platforms may receive different notifications, where the notifications have been tailored to the device platform capabilities, such as display size. For example, a user may have registered an airline application, which is transmitting a notification about a flight delay and gate change. For an email platform, the notification platform may deliver the entire notification (e.g., "Flight 123 has been delayed and is now departing from Gate 23 in Terminal 2"). However, for wearable computing glasses, the notification platform may deliver a notification having reduced information density (e.g., the notification may simply state "Delayed. Terminal 2").

The optimization of notifications to different devices can also include tailoring based on device input capabilities. A notification can include one or more actionable user interface elements (e.g., screen buttons, audio prompts or the like). For example, a response to a notification received at a desktop or laptop computing platform can be based on keyboard input,

a response from a touch screen device can be based on gesture input and a response from a wearable device (e.g., glasses and/or watches) may be based on voice input.

Notification messages can also be formatted based on priority. For example, the message font, font size, color, volume (for audio messages) can be formatted according to a message priority level (e.g., low, medium, high).

The optimization of the notifications can be performed at the notification platform level and/or at the device platform level. Each device can include the presentation optimization capabilities within the notification component (e.g., 602 – 606). The notification component (606) can have information about the device output components (608 – 612, respectively) and device input capabilities. The notification platform can deliver notification message to multiple devices (e.g., heterogeneous or homogenous devices) according to the methods set forth in FIGS. 7 and 8, which are described below.

FIG. 7 is a flow chart of an example method for notification delivery across multiple devices. Processing begins at 702, where one or more notification messages are received by a notification platform (e.g., 102). Processing continues to 704.

At 704, the system can determine at least one recipient associated with each message. Processing continues to 706.

At 706, the system can determine an account associated with each recipient. Based on the account information, the system can determine one or more devices associated with each account. Attributes for each device can be obtained from the account and/or from the devices. The attributes can include, but are not limited to, screen size, screen orientation, screen resolution, screen density, device type and device operating system. Processing continues to 708.

At 708, notification messages are tailored to each device based on the corresponding device attributes. The tailoring can include message format and/or content. Processing continues to 710.

At 710, the tailored notification messages are delivered to each device. The tailoring can be performed at the notification platform and/or at each device. If the tailoring was performed on each device, then at 710 the notification can be caused to be displayed. It will be appreciated that 702 – 710 can be repeated in whole or in part in order to accomplish a contemplated notification delivery task.

FIG. 8 is a flow chart of an example method for handling tailored notification messages on a device. Processing begins at 802, where one or more tailored notification messages are received (or generated if the tailoring is being performed on the device). Processing continues to 804.

At 804, the tailored notification message(s) are presented on an output component of the device (e.g., screen, audio output component, tactile output component or the like). Processing continues to 806.

At 806, the device optionally receives a response to one or more actionable user interface elements associated with a notification message. Processing continues to 808.

At 808, the response is optionally processed. For example, the system may need to process voice or gesture data to obtain a text value. Processing continues to 810.

At 810, the response is optionally sent to the notification platform (or directly to another application or system). It will be appreciated that 802 – 810 can be repeated in whole or in part in order to accomplish a contemplated notification delivery task.

FIGS. 9A-9C show example user interfaces for presenting notifications in accordance with some implementations. As shown in FIG. 9A, a notification user interface 900 includes a plurality of notifications (902 – 906), a previously read notifications element 908 and a notification icon 910. The notification icon 910 can indicate the presence and/or state of notifications. For example, the notification icon 910 can be a three-state bell, where a clear bell indicates that the user has no unread notifications (910 in FIG. 9A), a filled bell shows unread notifications (e.g., 912 in FIG. 9B), and a filled bell with a counter indicates unread notifications and the counter indicates the number of new unread notifications (e.g., 914 in FIG. 9C).

The previously read element 908 (or previously read bottom toolbar) toggles the user interface into a previously read view showing previously read messages. When the previously read element 908 is first tapped on a touch-screen interface (or selected on a pointer-based interface), the list of previously read notifications is displayed. The list can include a predetermined number of previously read notifications or a scrolling list that can be updated to retrieve any number of previously read messages in a scrolling list interface. When the previously read element 908 is tapped again on a touch-screen interface (or selected on a pointer-based interface), the list of previously read notifications is hidden (or minimized) and the display of current notifications is made visible.

A user can view one of a plurality of views of a notification. For example, by tapping or selecting a notification (e.g., 902 – 906) an expanded view can be displayed that shows just the new activity on the post, such as just the new comments. Also, a user can select to view a “full post” view of the notification where, for example, the entire post and all its activity history, such as all comments are displayed.

FIG. 10 shows an example user interface 1000 for presenting notifications and receiving an indication to dismiss a notification. For example, a notification 1002 can be dismissed by swiping across the notification. As shown by the dotted line arrows, the notification 1002 can be dismissed by a left to right swiping motion on a touch screen interface. For non-touch screen interface, a selectable element can be used to dismiss the notification.

FIG. 10 also shows that an unread notification 1004 can have a different visual appearance from a read notification 1006. For example, an unread notification 1004 can have a bolder appearance and/or a different border pattern or color around the notification. A read notification can have a more muted appearance (e.g., be “grayed out” or “ghosted”) and can have a different border color or pattern than a read notification.

FIG. 11 shows an example user interface 1100 for presenting notifications and a user interface element for dismissing notifications. The user interface 1100 can include a “dismiss all” element 1102 that, when tapped (or selected), causes all read and/or unread notifications to be dismissed.

FIG. 12 shows an example user interface 1200 with an empty notification tray and call to action. An empty notification tray can include a message indicating that there are no unread notifications. Also, when displaying an empty notification tray, a call to action element 1202 can be displayed that, when tapped (or selected), causes the user to be taken to another site or service such as a social network or the like. The call to action element 1202 can include dynamic information retrieved from the other service (e.g., social network) that can entice a user to remain engaged with the other service. For example, the call to action element 1202 can include information about recent social network activity such as “View 10 new posts from your groups” or the like.

FIG. 13 shows a diagram of an example low priority notification in accordance with some implementations. In particular, a user 1302 can have one or more groups of connected users 1304. The user 1302 can also have one or more extended groups 1306. The extended groups are groups that can include one or more users that are also members of the groups of connected users 1304.

In operation, a notification 1308 can be received from a user that is outside of the extended groups 1306 and the groups of connected users 1304. Such a notification can be categorized as a low-priority notification. The system can deliver low-priority notifications to the device for display in a section of notifications configured for low-priority notifications. Also, the low-priority notifications may not alert the user upon delivery (e.g., by ringing, buzzing, or visually alerting on a device) and may not be shown in a notification tray (e.g., a section of the device user interface configured to display notifications or icons indicating availability of notifications). Low-priority notifications may be loaded on demand by the device, which can reduce battery power and/or bandwidth usage associated with low priority notifications.

FIG. 14 shows a diagram of an example notification user interface in accordance with some implementations. In particular, a notification tray 1400 can include a new and unread notification section 1402, an unread notification section 1404, a low-priority notification section 1406 and a previously read notification section 1408.

In operation, new, unread incoming notifications can be sent to the new and unread section 1402. This section may be collapsed or may be expanded by default to enable a user to more readily view these notifications. Once a notification has been seen by a user, but not read, it can be moved to the unread notifications section 1404.

Once a notification has been read, that notification can be moved to the previously read notifications section 1408. The previously read notifications 1408 can be sorted and displayed by time-delivered to the previously read section. Previously read low-priority notifications can be accessed in a separate section of the previously read notifications section 1408.

Low-priority notifications, as described above, are held in the low priority notification section 1406, which can be collapsed by default and opened when requested by a user. Once a low-priority notification has been read, it can be moved to the previously read notification section 1408. Unread low-priority notifications can be ranked by social affinity and/or other factor(s).

The new and unread notifications 1402 and the unread notifications 1404 may both be shown as expanded sections in the user interface. The new and unread notifications 1402 may be made more visually prominent (e.g., by having bolder colors and or text, or the like) than the unread notifications 1404, which may be deemphasized by slight “graying out” of text and/or images, or by having more muted colors and/or text as compared to the new and unread notifications 1402.

FIG. 15 shows a diagram of an example user interface for setting notification preferences in accordance with some implementations. In particular, a notification setting interface 1500 can be configured to permit a user to select “who can notify me”. In other words, the user can select which users or groups that notifications are permitted to be received from. The notifications settings can also be used to determine which notifications are considered “normal” priority and which are considered low-priority.

In operation, a user can select to receive notifications from one or more of extended groups 1502, the public 1504, other users in the user’s groups 1506, and only the user 1508. The

user can also select the “Pick People and Groups” selection 1510, which is configured to permit the user to select specific users and/or groups from which to receive notifications. The user interface also includes a cancel element 1512 to close the interface without making changes. Any changes to the notification settings can be automatically saved when the user exits the interface via any method other than the cancel element 1512, or a user interface element for saving the setting changes (not shown) can be provided.

In addition to, or as an alternative to, the method described above for determining a low-priority notification, the device and/or notification platform can also use the notification setting to determine low-priority notifications. For example, the notification platform and/or device can determine that any notification not from one of the users or groups selected in the settings user interface 1500 is a low-priority notification.

FIG. 16 shows a diagram of an example user interface 1600 for viewing user information from a notification. In operation, when an icon or image of a user associated with a notification 1602 is tapped (or selected), a profile page 1604 associated with that user can be displayed.

FIG. 17 shows a diagram of an example user interface 1700 for viewing user information for multiple users from a notification. In operation, when an icon or image of multiple users associated with a notification 1702 is tapped (or selected), a list 1704 showing the users and, optionally, an action taken by each user associated with the notification can be displayed. Also, the user list interface 1704 can include a button, link or other element 1706 to view the post that the users in the list took an action on (e.g., recommended, commented on, reposted or the like).

It will be appreciated that a user interface in accordance with the disclosed subject matter can include one or more of the features described above (e.g., the features described in connection with FIGS. 9 – 17). Also, it will be appreciated that the example user interfaces

shown in FIGS. 9 – 17 can be implemented on mobile devices (e.g., wireless devices, tablets or the like) and on other devices such as desktop and laptop computers.

Moreover, some implementations of the disclosed method, system, and computer readable media can be implemented in software (e.g., as a computer program product and/or nontransitory computer readable media having stored instructions for notification platforms as described herein). The stored software instructions can be executed on a programmed general purpose computer, a special purpose computer, a microprocessor, or the like.

It is, therefore, apparent that there is provided, in accordance with the various example implementations disclosed herein, systems, methods and computer readable media for notification platforms.

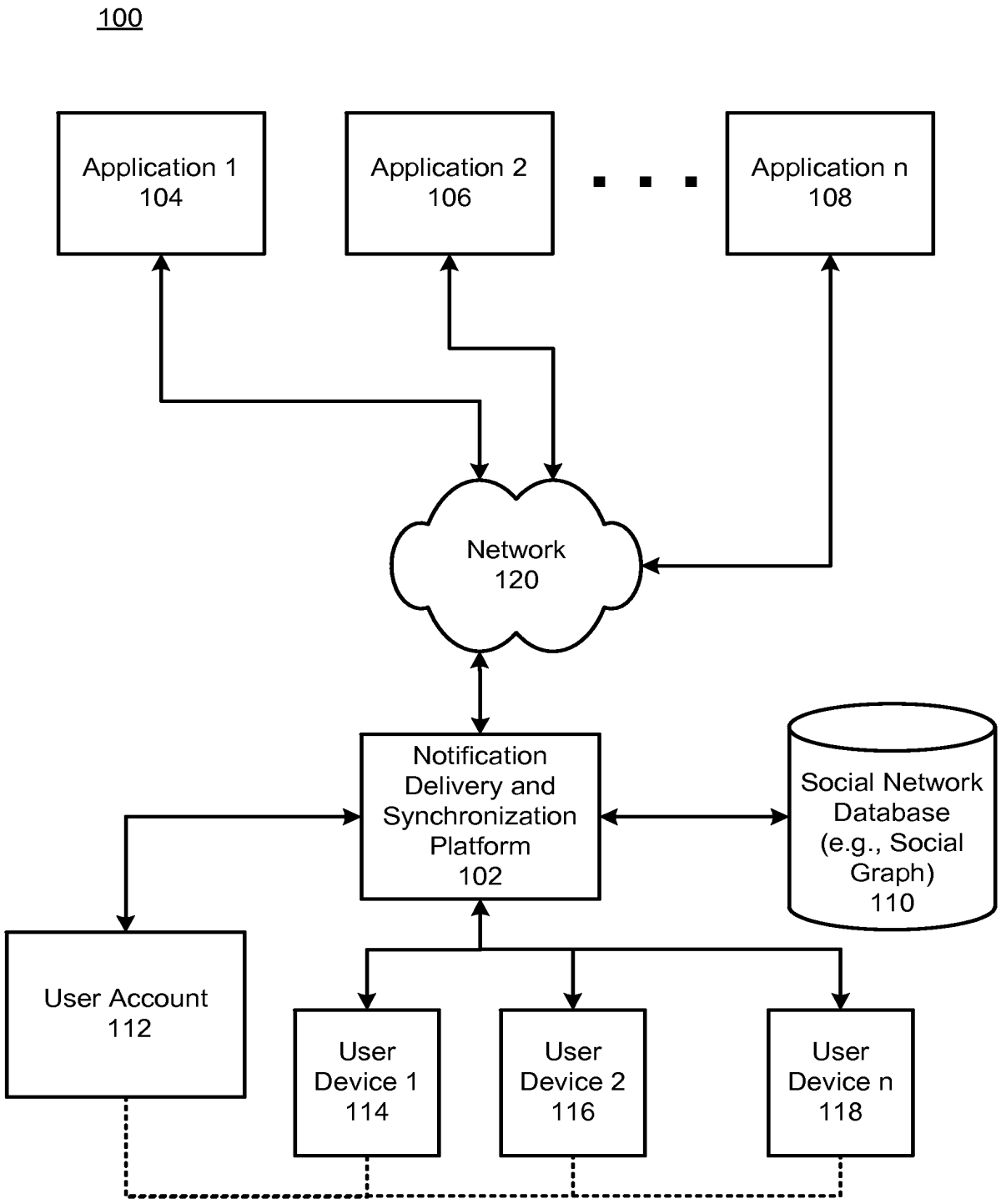
100
Application 1
104
Application 2
106
Application n
108
Network
120
Notification
Delivery and
Synchronization
Platform
102
Social Network
Database
(e.g., Social
Graph)
110
User Account
112
User
Device 1
114
User
Device 2
116
User
Device n
118

FIG. 1

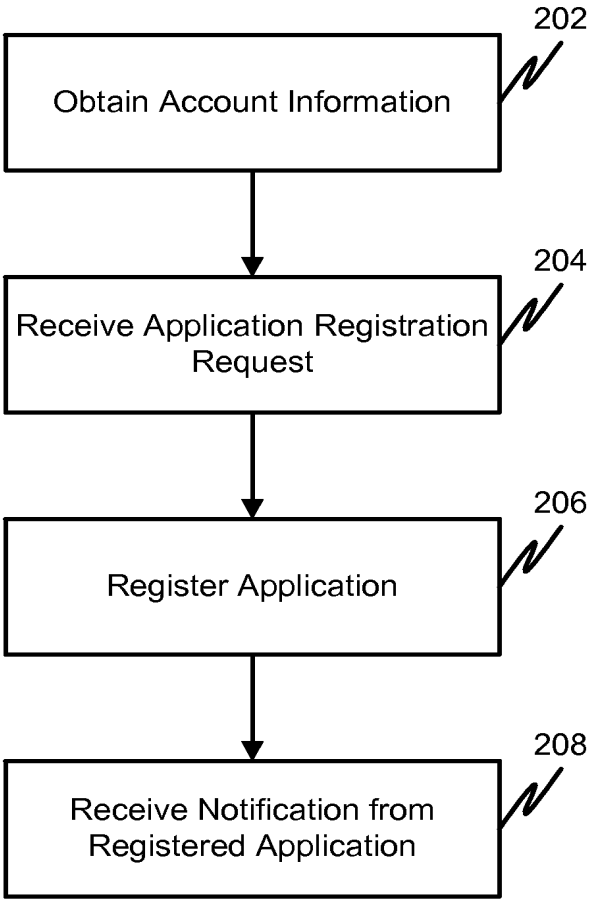
202
Obtain Account Information
204
Receive Application Registration Request
206
Register Application
208
Receive Notification from Registered Application

FIG. 2

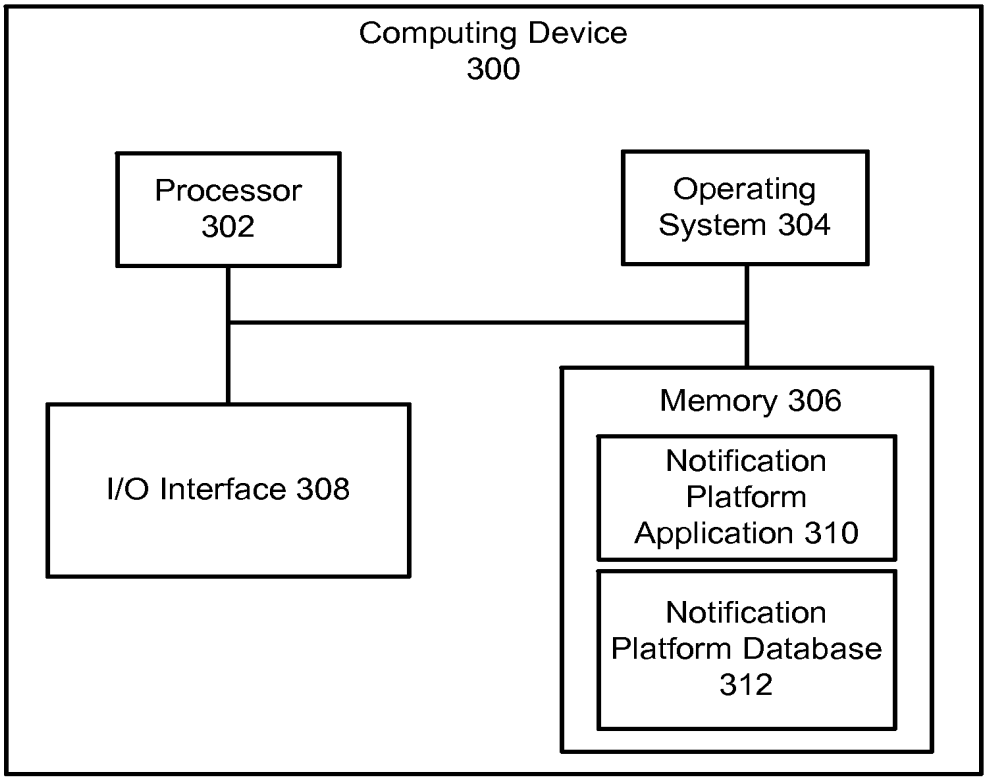
Computing Device
300
Processor
302
Operating
System 304
I/O Interface 308
Memory 306
Notification
Platform
Application 310
Notification
Platform Database
312

FIG. 3

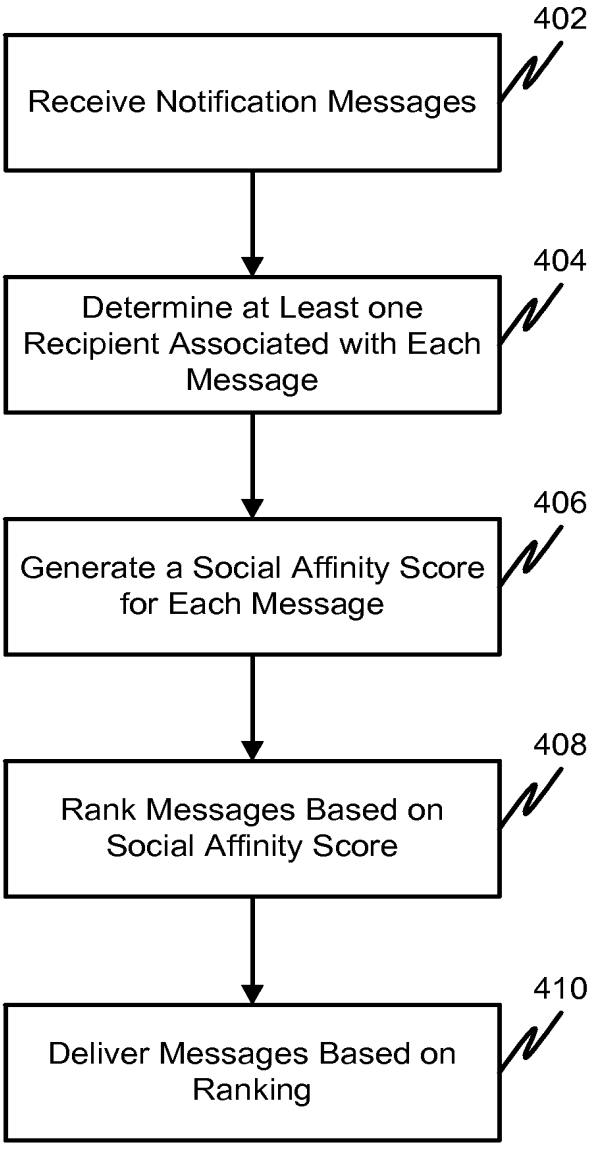
402
Receive Notification Messages
404
Determine at Least one Recipient Associated with Each Message
406
Generate a Social Affinity Score for Each Message
408
Rank Messages Based on Social Affinity Score
410
Deliver Messages Based on Ranking

FIG. 4

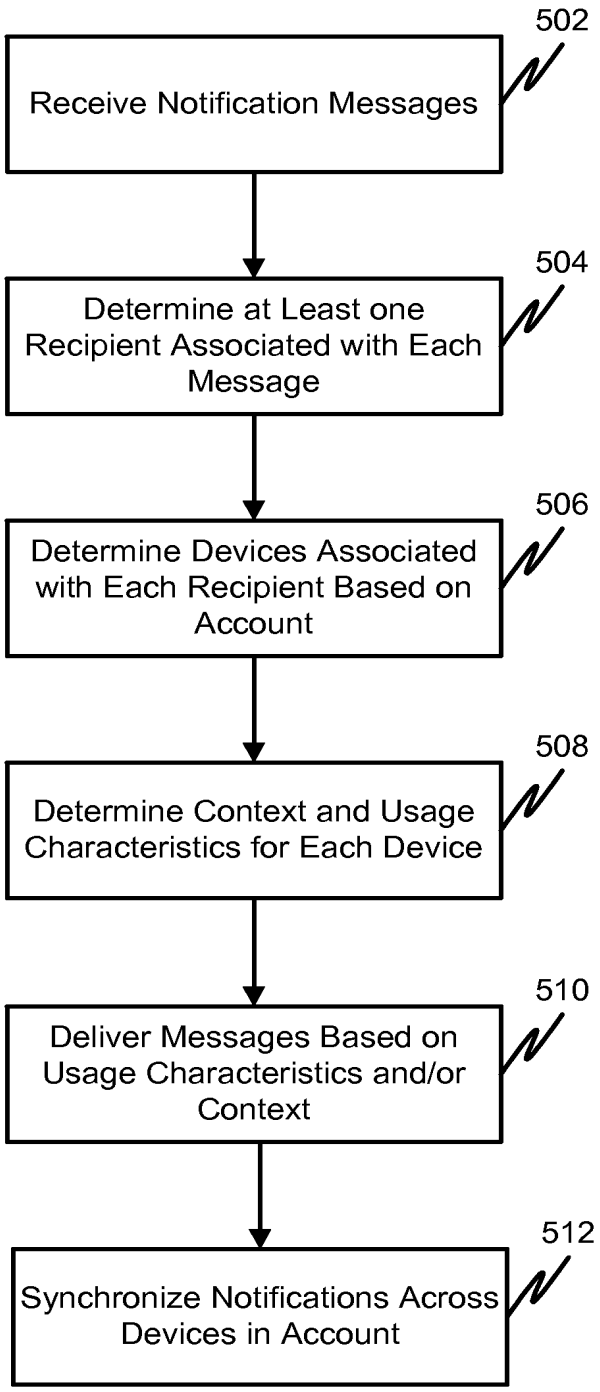
502
Receive Notification Messages
504
Determine at Least one Recipient Associated with Each Message
506
Determine Devices Associated with Each Recipient Based on Account
508
Determine Context and Usage Characteristics for Each Device
510
Deliver Messages Based on Usage Characteristics and/or Context
512
Synchronize Notifications Across Devices in Account

FIG. 5

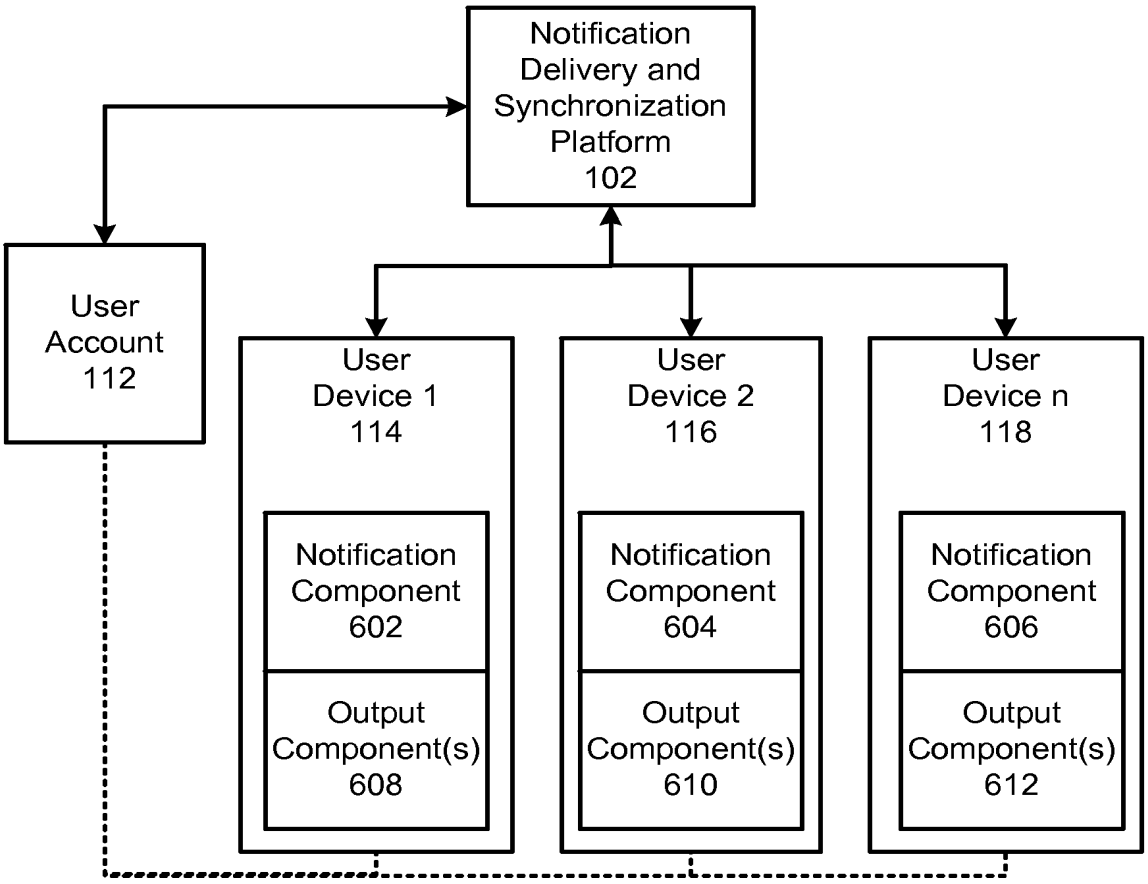
Notification Delivery and Synchronization Platform 102
User Account 112
User Device 1 114
Notification Component 602
Output Component(s) 608
User Device 2 116
Notification Component 604
Output Component(s) 610
User Device n 118
Notification Component 606
Output Component(s) 612

FIG. 6

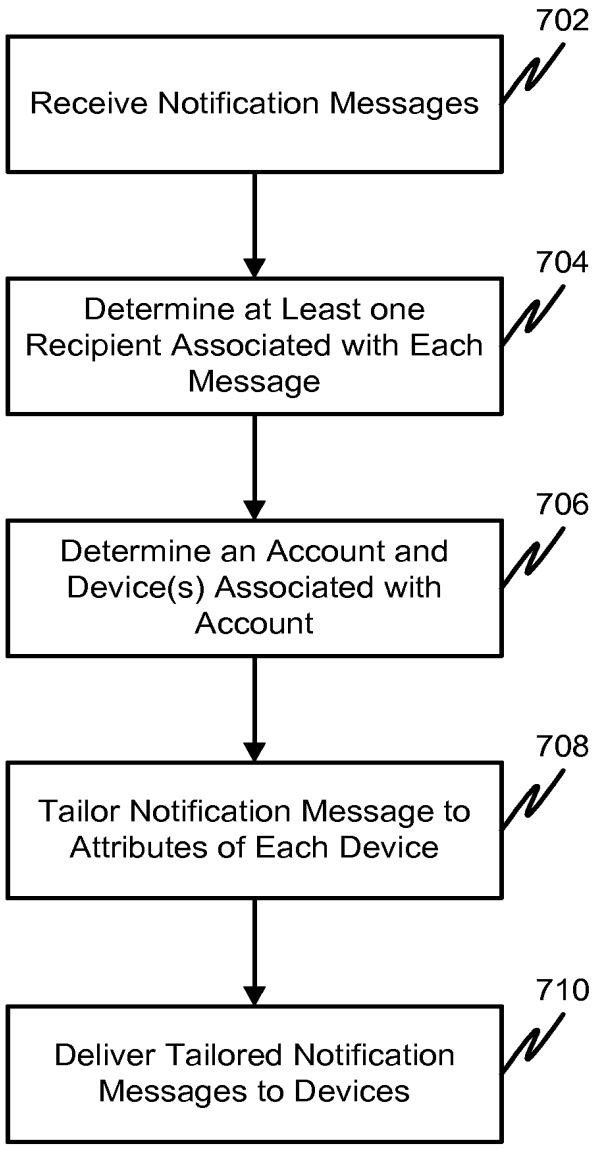
702
Receive Notification Messages
704
Determine at Least one Recipient Associated with Each Message
706
Determine an Account and Device(s) Associated with Account
708
Tailor Notification Message to Attributes of Each Device
710
Deliver Tailored Notification Messages to Devices

FIG. 7

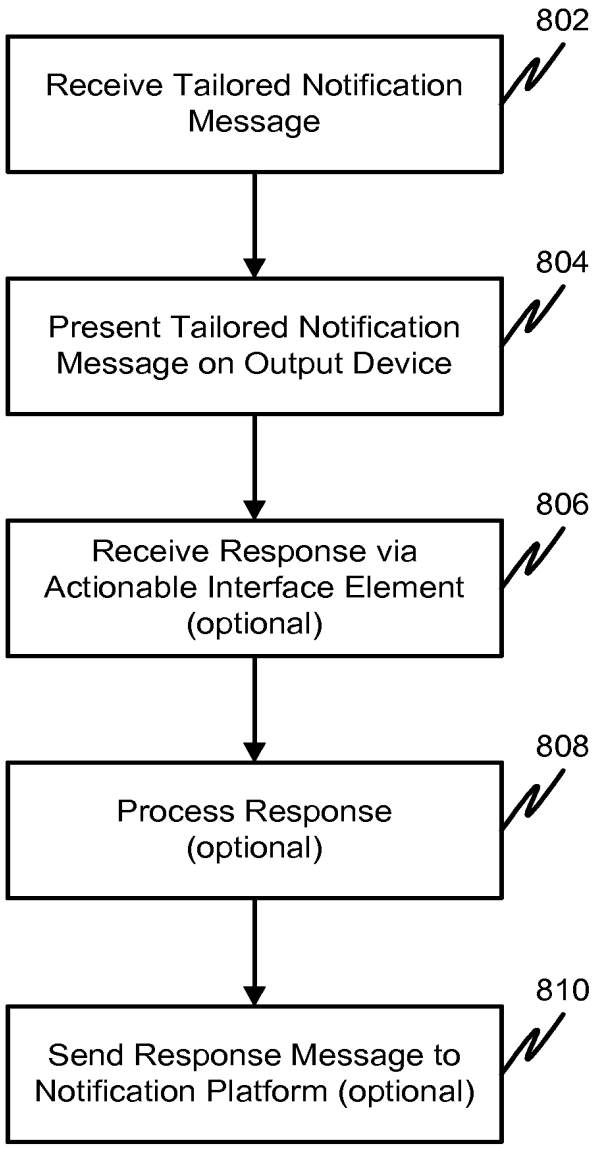
802
Receive Tailored Notification Message
804
Present Tailored Notification Message on Output Device
806
Receive Response via Actionable Interface Element (optional)
808
Process Response (optional)
810
Send Response Message to Notification Platform (optional)

FIG. 8

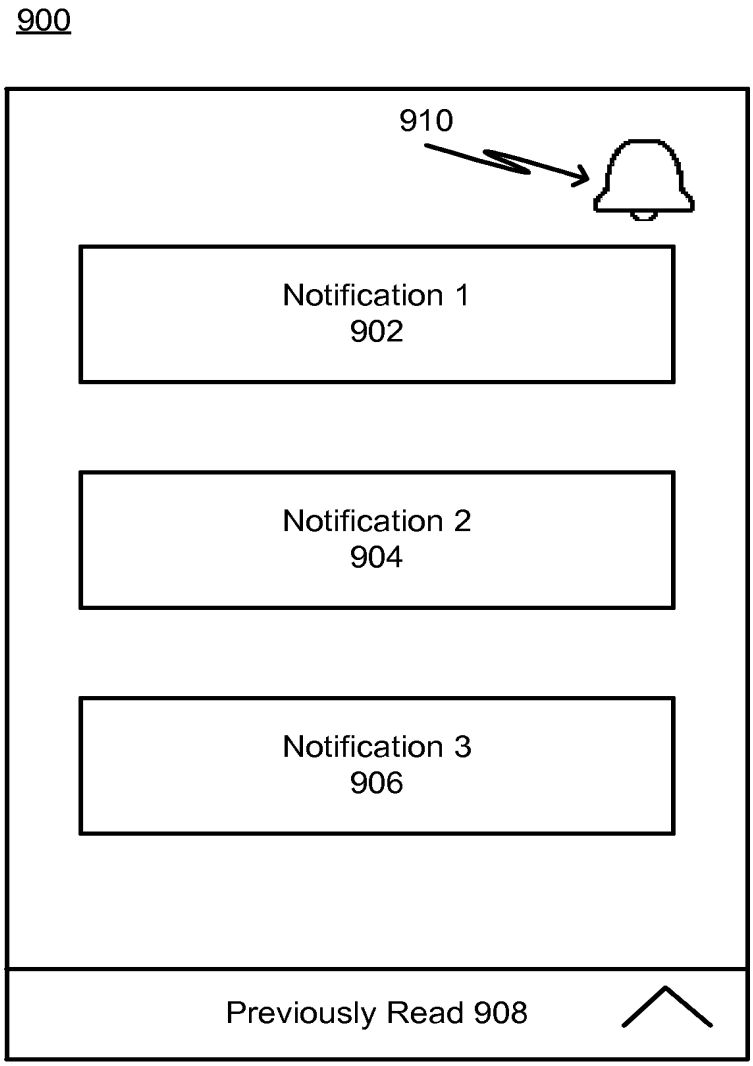
900
910
Notification 1
902
Notification 2
904
Notification 3
906
Previously Read 908

FIG. 9A

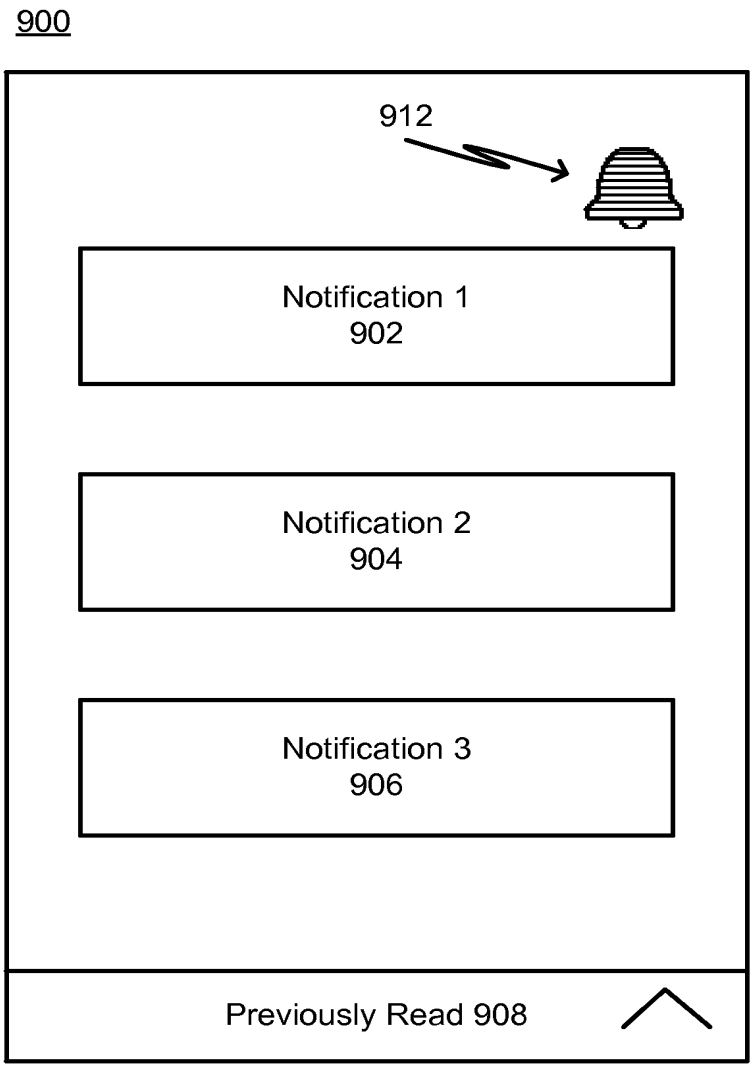
900
912
Notification 1
902
Notification 2
904
Notification 3
906
Previously Read 908

FIG. 9B

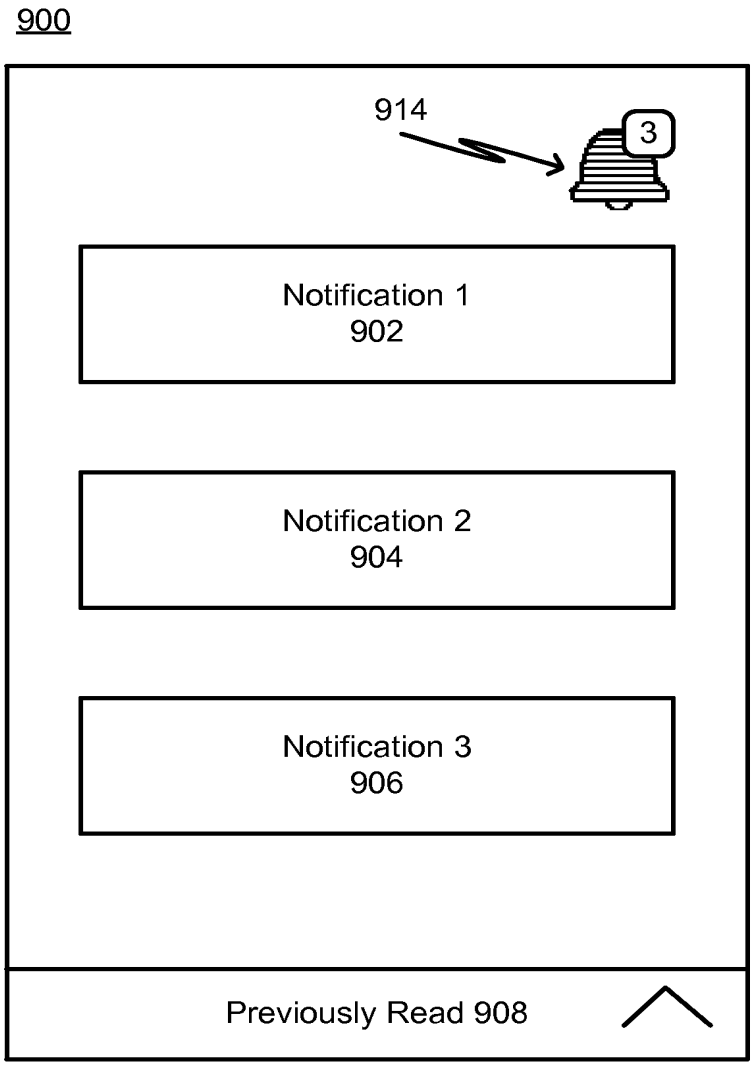
900
914
3
Notification 1
902
Notification 2
904
Notification 3
906
Previously Read 908

FIG. 9C

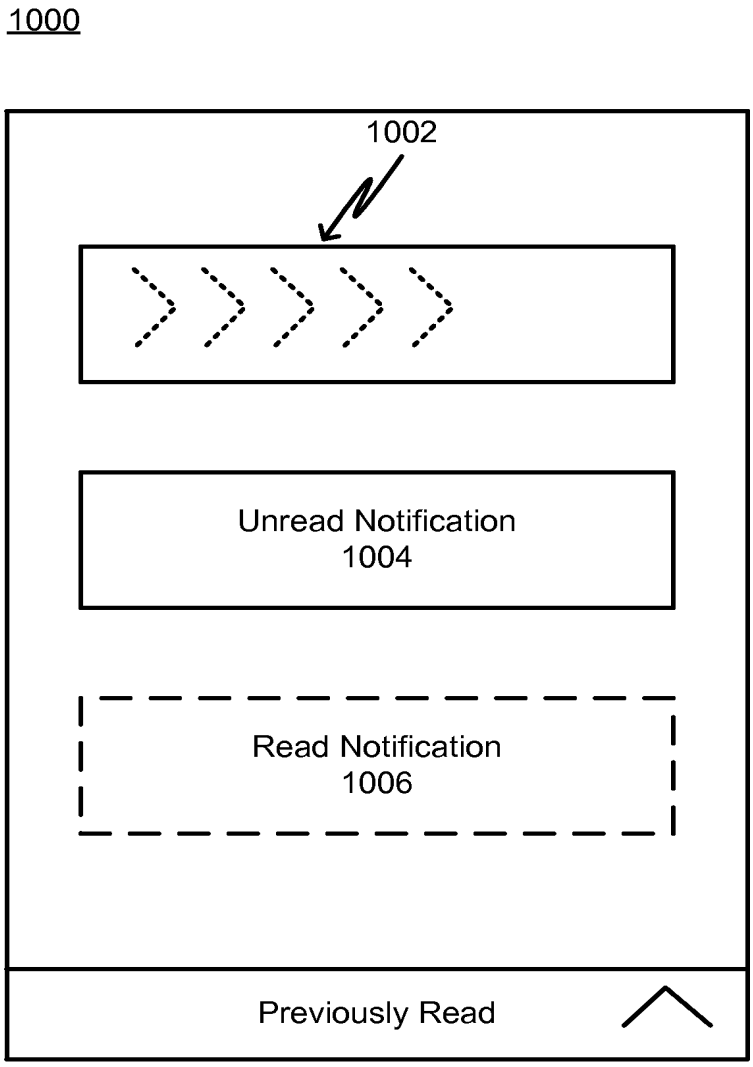
1000
1002
Unread Notification
1004
Read Notification
1006
Previously Read

FIG. 10

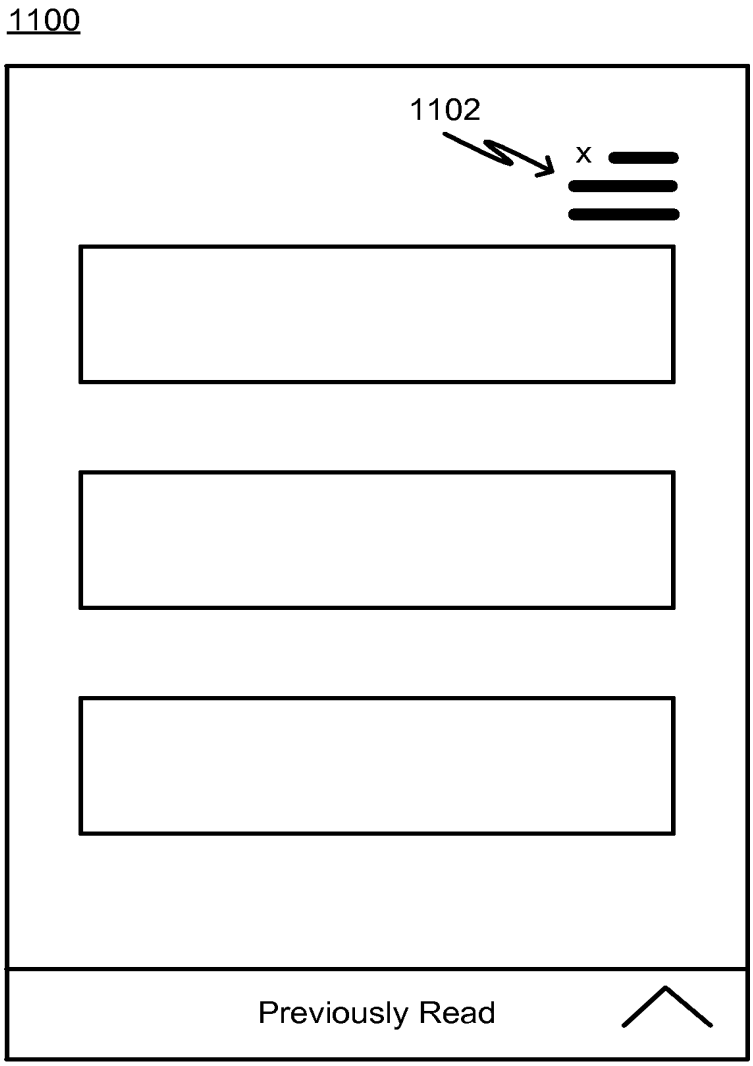

FIG. 11

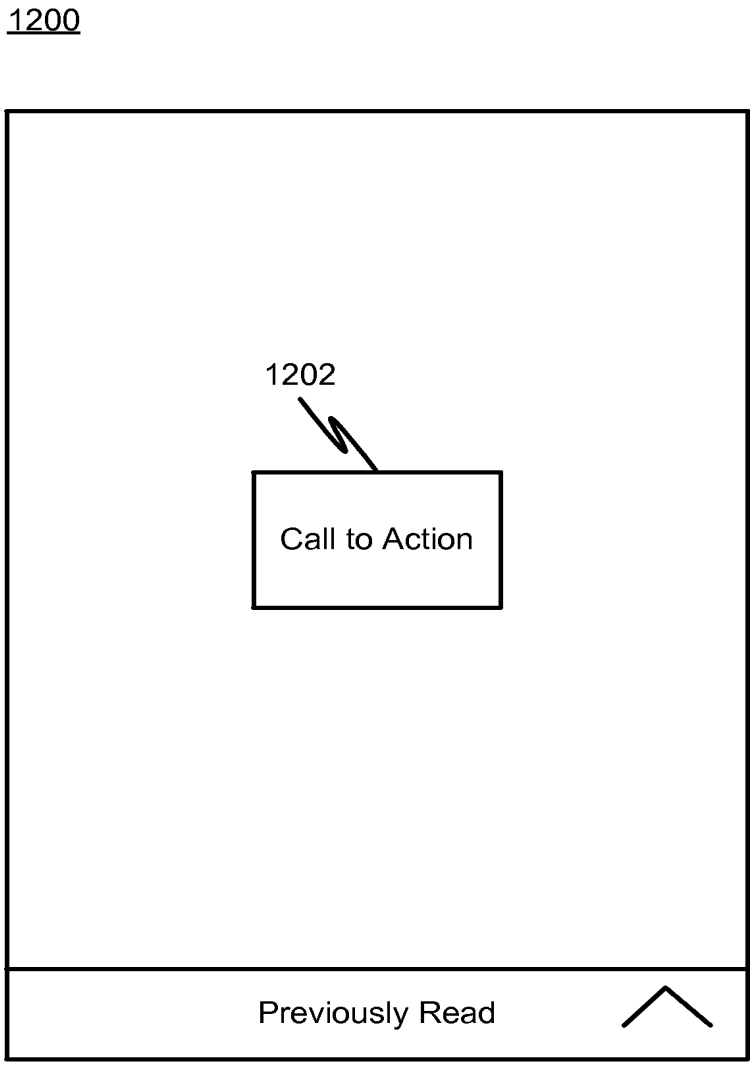

FIG. 12

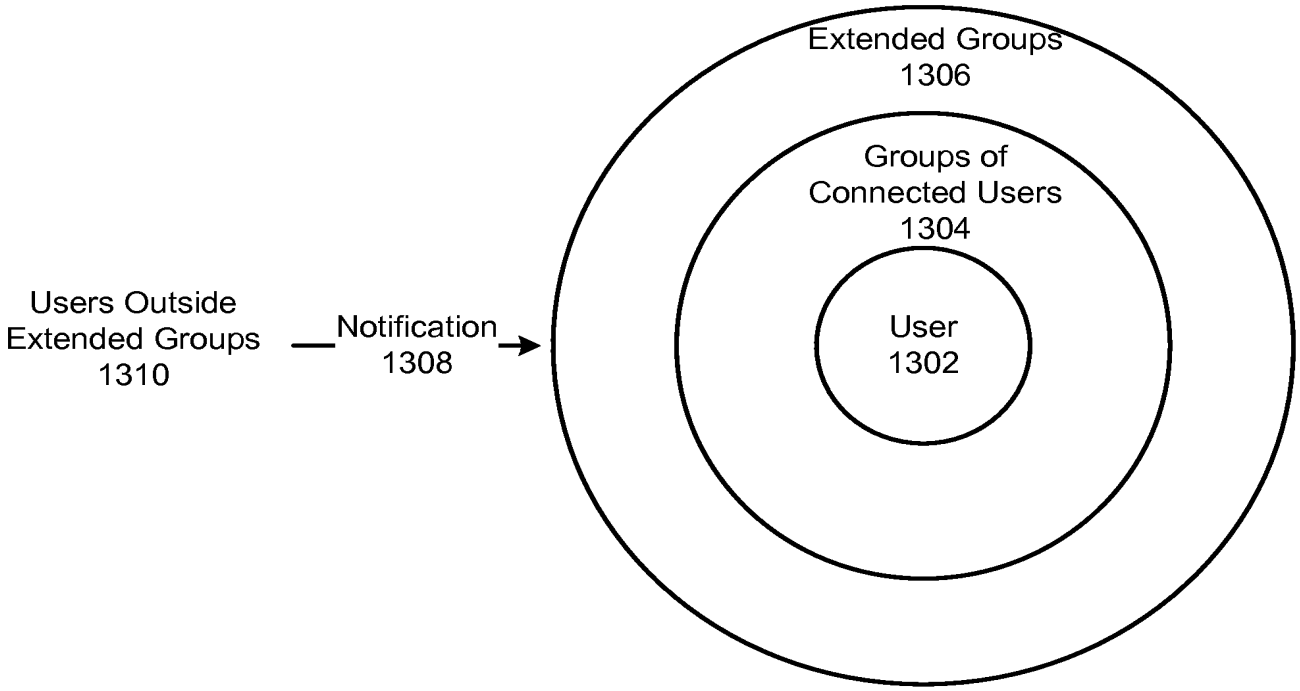
Extended Groups
1306
Groups of
Connected Users
1304
User
1302
Users Outside
Extended Groups
1310
Notification
1308

FIG. 13

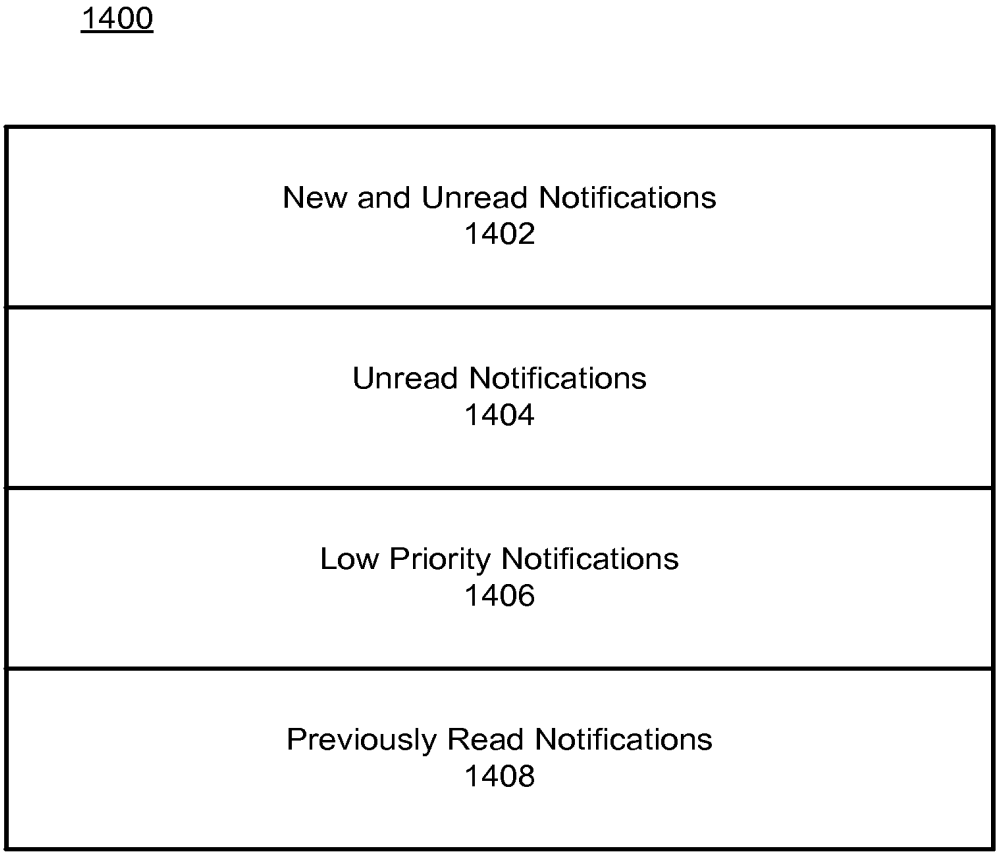
1400
New and Unread Notifications
1402
Unread Notifications
1404
Low Priority Notifications
1406
Previously Read Notifications
1408

FIG. 14

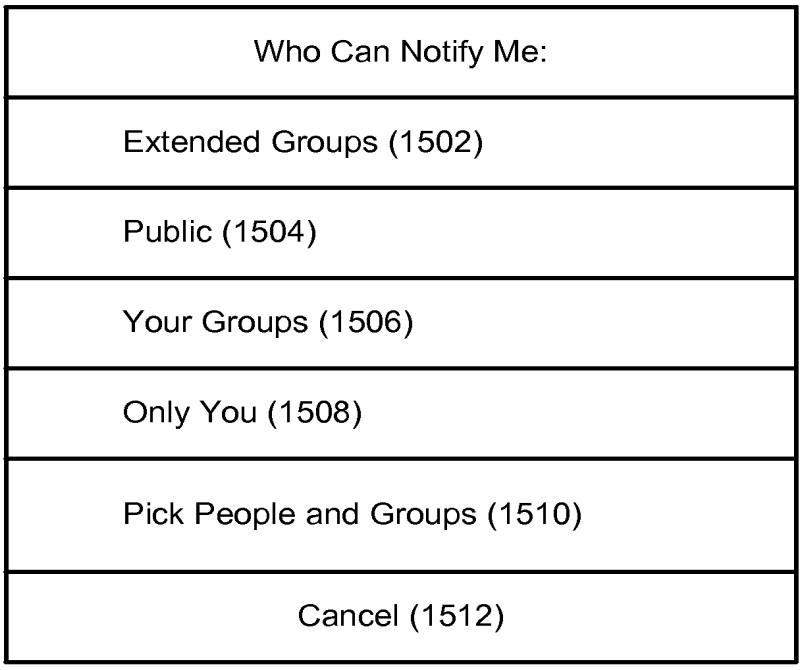
1500
Who Can Notify Me:
Extended Groups (1502)
Public (1504)
Your Groups (1506)
Only You (1508)
Pick People and Groups (1510)
Cancel (1512)

FIG. 15

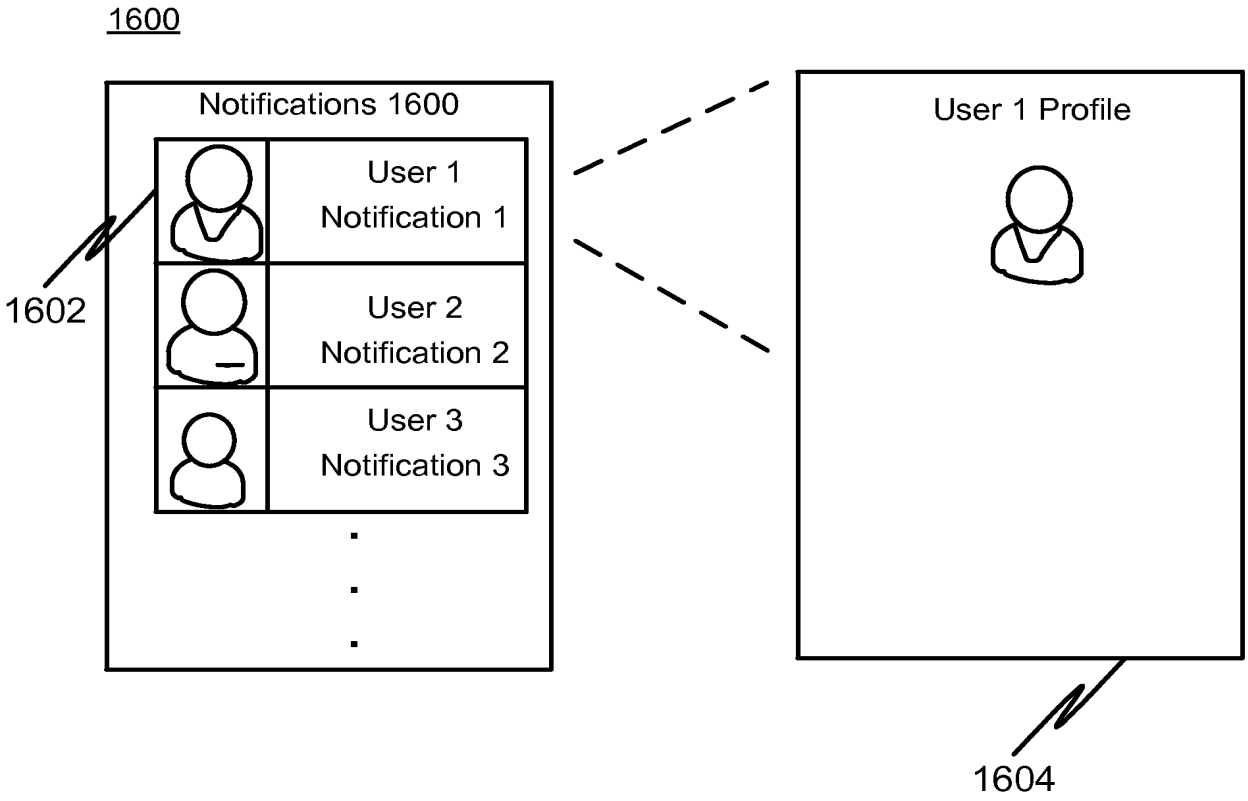
1600
Notifications 1600
User 1
Notification 1
User 2
Notification 2
User 3
Notification 3
1602
User 1 Profile
1604

FIG. 16

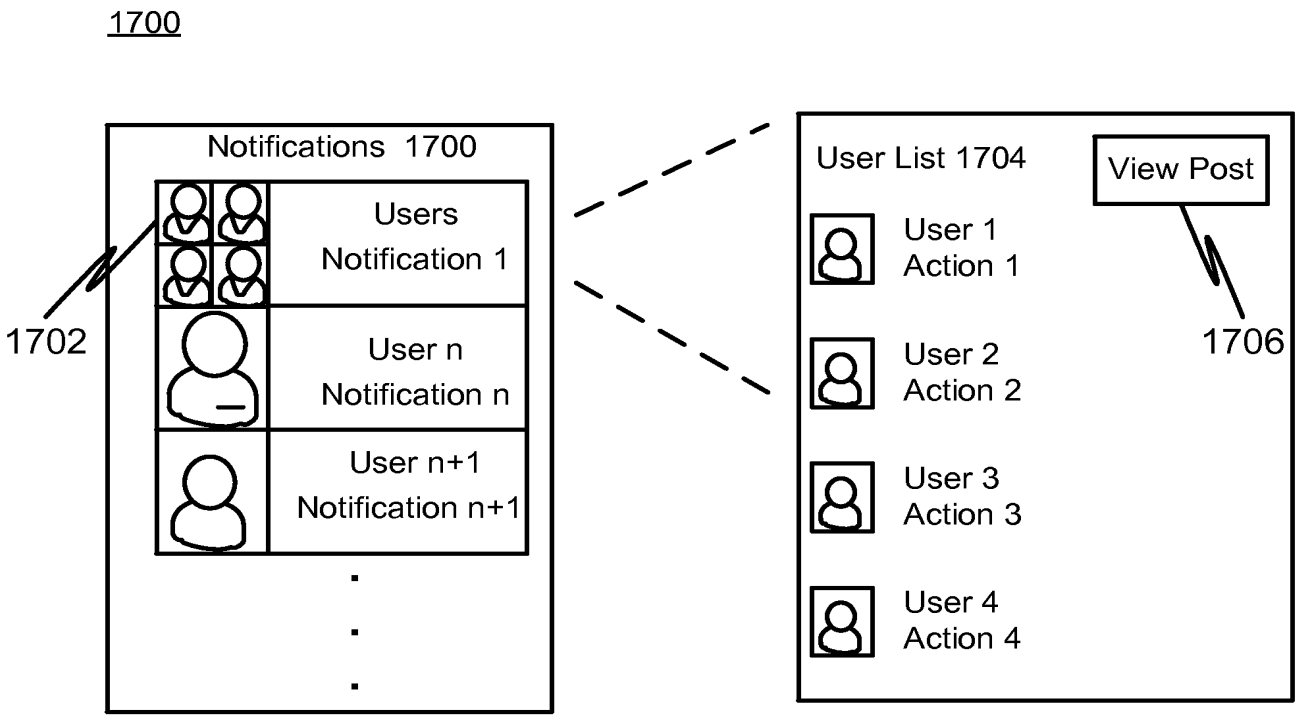
1700
Notifications 1700
Users
Notification 1
User n
Notification n
User n+1
Notification n+1
1702
User List 1704
View Post
User 1
Action 1
User 2
Action 2
User 3
Action 3
User 4
Action 4
1706

FIG. 17